MATH

GRADE 8

Revision

End of Term 3
2018 / 2019

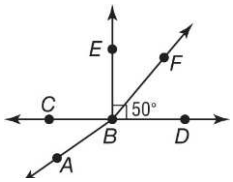
Chapter 5 (Triangles and the Pythagorean Theorem)

Part 1

Choose the correct answer:

1. What type of angle is $\angle ABC$?

A) acute **B)** right **C)** obtuse **D)** straight

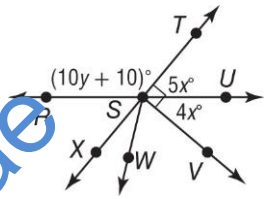


2. Which is true?

A) $m\angle EBF = 140$ **B)** $m\angle EBF = 90$

C) $m\angle EBF = 50$ **D)** $m\angle EBF = 40$

For Exercises 3-5, use the figure at the right.



3. Which pair of angles are vertical angles?

A) $\angle RST, \angle TSU$ **B)** $\angle RSX, \angle TSU$

C) $\angle TSU, \angle USV$ **D)** $\angle RSX, \angle XSW$

4. Which angle is supplementary to $\angle USV$?

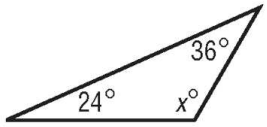
A) $\angle TSU$ **B)** $\angle VSW$ **C)** $\angle RSV$ **D)** $\angle WSR$

5. Find the values of x and y.

A) $x = 10, y = 12$ **B)** $x = 20, y = 7$ **C)** $x = 10, y = 8$ **D)** $x = 50, y = 40$

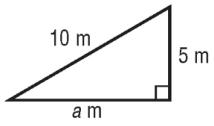
6. The values of x in the triangle is

A) 120 **B)** 60 **C)** 80 **D)** 100



7. Find the length a in the following right triangle.

A) $\sqrt{75}$ **B)** $\sqrt{65}$ **C)** $\sqrt{85}$ **D)** $\sqrt{57}$

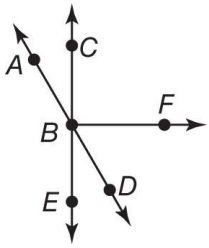


For Exercises 8-9, use the figure at the right.

8. Find $m\angle FBD$ if $\angle FBD$ and $\angle DBE$ are complementary and $m\angle FBD$ is twice $m\angle DBE$.

A) 30° **B)** 60°

C) 45° **D)** 90°



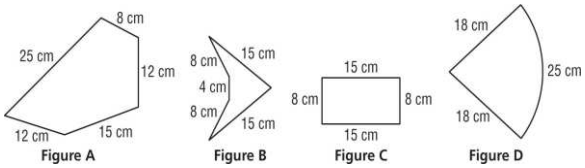
9. Which angle is a vertical angle to $\angle ABE$?

A) $\angle DBE$ **B)** $\angle CBD$

C) $\angle ABC$ **D)** $\angle EBA$

10. Which figure is not a polygon?

A) Figure *A* **B)** Figure *B*
C) Figure *C* **D)** Figure



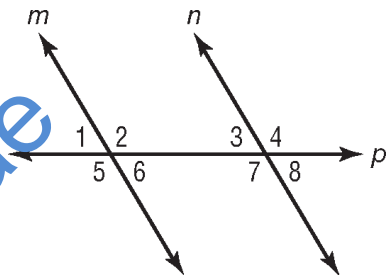
Part 2

*** In the figure, line *m* is parallel to line *n*. Classify each pair of angles as *alternate interior, alternate exterior, or corresponding.***

∠1 and ∠8	∠5 and ∠7	∠3 and ∠6	∠2 and ∠4	∠2 and ∠7
alternate exterior	corresponding	alternate interior	corresponding	alternate interior

If $m\angle 4 = 122°$, find each given angle measure. Justify your answer.

$m\angle 8 = 58$	Straight line (180-122) = 58
$m\angle 5 = 122$	Alternate Exterior to angle 4
$m\angle 2 = 122$	Corresponding to angle 4 or vertical to angle 5
$m\angle 1 = 58$	Alternate Exterior to 8 or angle 1 & 2 make a straight line
$m\angle 6 = 58$	Corresponding to angle 8 or vertical to angle 1
$m\angle 7 = 122$	Vertical to angle 4 or angle 7 & angle 3 are corresponding angles

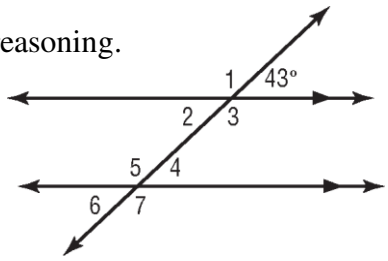


A) List all the angles congruent to the given angle. Explain your reasoning.

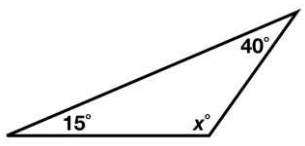
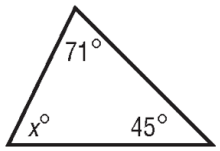
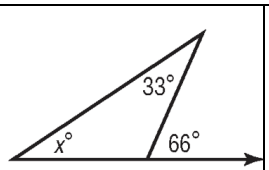
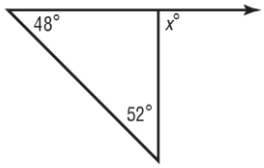
angle 2 - vertical angles
angle 4 - corresponding angles
angle 6 - alternate exterior angles

B) List all the angles congruent to ∠5. Explain your reasoning.

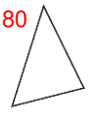
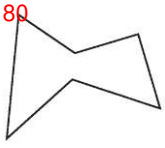
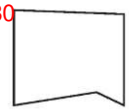
angle 7 - vertical angles
angle 3 - alternate interior angles
angle 1 - corresponding angles



***Find the value of *x* in each triangle with the given angle measures:**

			
$x =$ 125°	$x =$ 64°	$x =$ 33°	$x =$ 100°

***Find the sum of the interior angle measures of each polygon:**

(3-2) x 180 = 180° 	(4-2) x 180 = 360° 	(6-2) x 180 = 720° 	(5-2) x 180 = 540° 

*** Find the sum of the interior angle measures of each polygon.**

A) 13-gon (13-2) x 180 = 1980°

B) 18-gon (18-2) x 180 2880°

*** Find the measure of one interior angle in each regular polygon. Round to the nearest tenth if necessary.**

A. heptagon (7-sided) = 128.6°

B. 26-gon = 166.2°

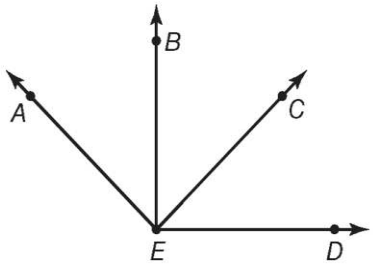
*** Complete each proof with either statements or reasons.**

1. Given: AC = 12 and BC is twice the length of AB.
Prove: BC = 8

Statements	Reasons
a. AC = 12 BC = 2(AB)	Given
b. AB + BC = AC	Line Segment Addition
c. AB + 2(AB) = 12	Substitution
d. 3 (AB) = 12	Combine Like Terms
e. AB = 4	Division
f. BC = 2(4)	Substitution
g. BC = 8	Multiply

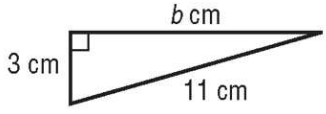
2. Given: ∠AEC is a right angle; ∠AEB ≅ ∠CED
Prove: ∠BED is a right angle

Statements	Reasons
a. $m\angle AEC = 90$ $\angle AEB \cong \angle CED$	Given
b. $m\angle AEB + m\angle BEC = m\angle AEC$	Sum of adjacent angles
c. $m\angle AEB + m\angle BEC = 90$	Substitution
d. $m\angle BEC + m\angle CED = m\angle BED$	Sum of adjacent angles
e. $m\angle BEC + m\angle AEB = m\angle BED$	Substitution
f. $90 = m\angle BED$	Substitution
g. $\angle BED$ is a right angle	Definition of right angle

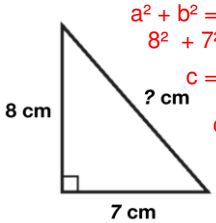


*** Write an equation you could use to find the length of the missing side of each right triangle. Then find the missing length. Round to the nearest tenth if necessary.**

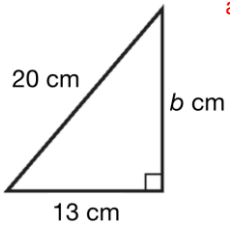
$a^2 + b^2 = c^2$
$3^2 + b^2 = 11^2$
$b = \sqrt{(121 - 9)}$
$b = 10.6$ cm



$a^2 + b^2 = c^2$
$8^2 + 7^2 = c^2$
$c = \sqrt{113}$
$c = 10.6$



$a^2 + b^2 = c^2$
$13^2 + b^2 = 20^2$
$b = \sqrt{(400-169)}$
$b = 15.2$



*** Determine whether each triangle with sides of given lengths is a right triangle. Justify your answer.**

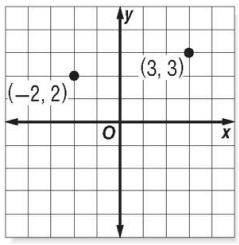
A. 7 cm, 14 cm, 16 cm $16^2 \neq 7^2 + 14^2$

No not right

B. 40 m, 42 m, 58 m $58^2 = 42^2 + 40^2$

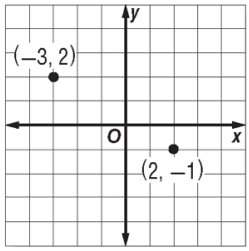
Yes right

*** Find the distance between each pair of points whose coordinates are given. Round to the nearest tenth if necessary.**



$d = \sqrt{(3 - -2)^2 + (3 - 2)^2}$

$d = 5.1$

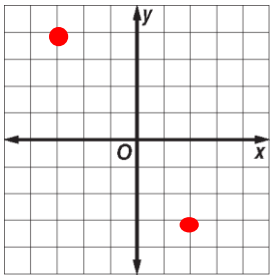


$d = \sqrt{(2 - -3)^2 + (-1 - 2)^2}$

$d = 5.8$

*** Graph each pair of ordered pairs. Then find the distance between the points. Round to the nearest tenth if necessary.**

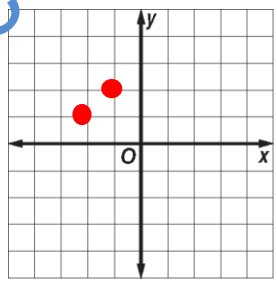
(–3, 4), (2, –3)



$d = \sqrt{(2 - -3)^2 + (-3 - 4)^2}$

$d = 8.6$

(–2, 1), (–1, 2)

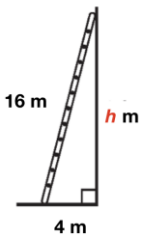


$d = \sqrt{(-1 - -2)^2 + (2 - 1)^2}$

$d = 1.4$

*** Write an equation that can be used to answer the question. Then solve. Round to the nearest tenth if necessary.**

* How high will the ladder reach?

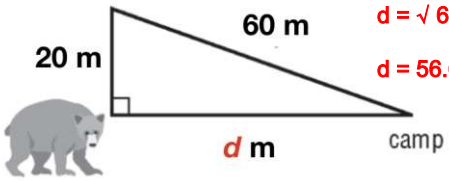


$4^2 + h^2 = 16^2$

$h = \sqrt{16^2 - 4^2}$

$h = 15.5$ m

* How far is the bear from camp?



$20^2 + d^2 = 60^2$

$d = \sqrt{60^2 - 20^2}$

$d = 56.6$ m

Chapter 6 (Transformations)

Part 1

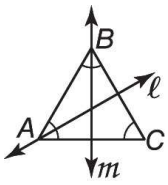
Choose the correct answer:

1. Given $A(3, -7)$, under which reflection is $A'(3, 7)$?

A) reflection in the x-axis
B) reflection in the origin
C) reflection in the y-axis
D) reflection in the line $y = 5$

2. Name the image of $\overline{BC}$ under reflection in line m.

A) $\overline{BC}$
B) $\overline{AC}$
C) $\overline{BA}$
D) line ℓ



3. Point J with coordinates $(-2, 1)$ is translated $(x - 3, y - 3)$ and then reflected in the x-axis. What are the coordinates of J''?

A) $J''(-5, -2)$
B) $J''(2, 1)$
C) $J''(-5, 2)$
D) $J''(2, -1)$

4. Given $B(-4, -6)$, under which reflection is $B'(4, -6)$?

A) reflected in the x-axis
B) reflected in the line $y = -2$
C) reflected in the y-axis
D) reflected in the line $y = x$

5. Which transformation moves all points the same distance in the same direction?

A) rotation
B) reflection
C) translation
D) dilation

6. What is the image of $X(3, 5)$ along the translation vector $(x - 4, y + 6)$?

A) $X'(7, -1)$
B) $X'(7, 11)$
C) $X'(-1, -1)$
D) $X'(-1, 11)$

7. Point $K(-2, 1)$ is rotated 90° clockwise about the origin. What are the coordinates of K'?

A) $K'(-2, 1)$
B) $K'(2, -1)$
C) $K'(1, 2)$
D) $K'(-1, -2)$

8. Find the image of $A(3, 7)$ under a translation along $(x - 4, y + 2)$.

A) $A'(-7, -5)$
B) $A'(-1, 9)$
C) $A'(7, 5)$
D) $A'(1, -9)$

For Questions 9 and 10, find the coordinates of the image of the point after the given composition of transformations.

9. $B(7, -2)$; translation 1 unit down, reflection in the x-axis

A) $B''(-7, -3)$
B) $B''(-3, 7)$
C) $B''(7, 3)$
D) $B''(7, 1)$

10. $C(-5, 3)$; rotation 90° counterclockwise about origin, reflection in the y-axis

A) $C''(5, 3)$ **B)** $C''(-3, 5)$ **C)** $C''(3, -5)$ **D)** $C''(-3, -5)$

11. What is the image of $Y(-4, 7)$ under the translation (x +3, y –5)?

A) $Y'(-1, 2)$ **B)** $Y'(-1, 12)$ **C)** $Y'(-7, 2)$ **D)** $Y'(-7, 12)$

12. Which transformation turns every point of the preimage through a specified angle and direction about a fixed point?

A) reflection **B)** rotation **C)** translation **D)** dilation

13. The point $I(-4, -1)$ is rotated 90° counterclockwise about the origin. What is the image of I?

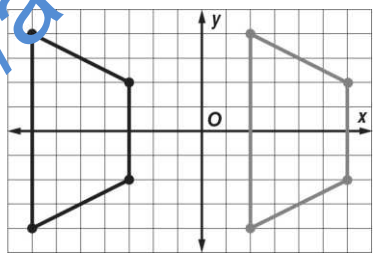
A) $I'(4, -1)$ **B)** $I'(1, -4)$

C) $I'(4, 1)$ **D)** $I'(-1, -4)$

14. Which is the best description of the translation at the right?

A) (x+8, y+4) **B)** (x+9, y+0)

C) (x+4, y+8) **D)** (x+0,y+ 8)



15. Find the coordinates of the image of $D(-1, -2)$ after the composition of a reflection in the x-axis and a rotation 270° counterclockwise about the origin.

A) $D''(-2, 1)$ **B)** $D''(2, 1)$ **C)** $D''(-1, 2)$ **D)** $D''(-1, -2)$

16. The line segment $\overline{CD}$ with endpoints $C(5, -7)$ and $D(-3, 9)$ is rotated 270° about the origin. What is the coordinate of D'?

A) $D'(-3, -9)$ **B)** $D'(3, -9)$ **C)** $D'(9, -3)$ **D)** $D'(9, 3)$

17. Find the image of $P(-2, 4)$ under a translation by (x+6, y+5).

A) P' (4, 9) **B)** P' (–4, –9) **C)** P' (–8, –1) **D)** P' (8, 1)

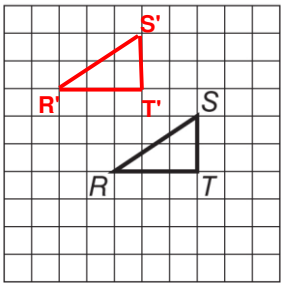
18. $HIJK$ is a trapezoid with $H(5, 4)$, $I(10, -2)$, $J(-8, -2)$, and $K(-3, 4)$. Find the coordinates of the image of H under the translation by (x+10, y–11).

A) $H'(20, -13)$ **B)** $H'(15, -7)$ **C)** $H'(-5, 15)$ **D)** $H'(7, -7)$

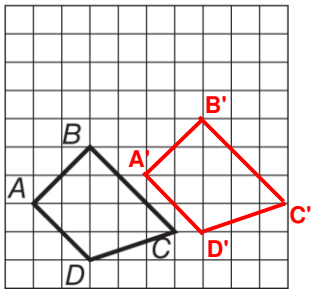
Part 2

*** Graph the image of the figure after the indicated translation.**

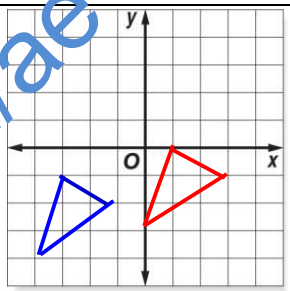
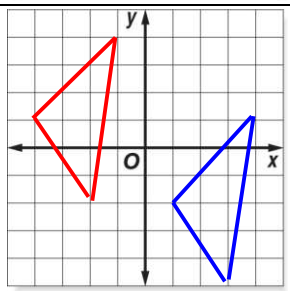
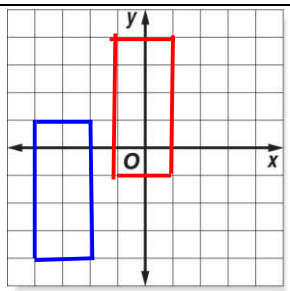
1. 2 units left and 3 units up

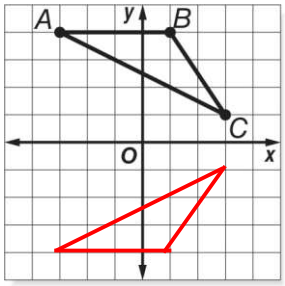
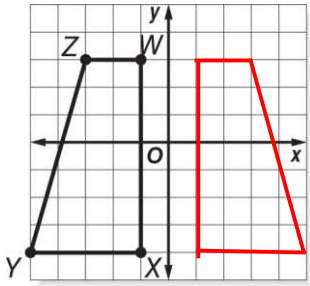


2. 4 units right and 1unit up

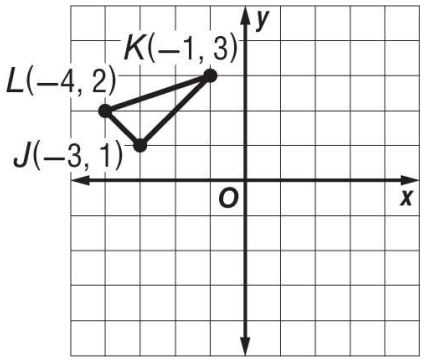


*** Graph the figure with the given vertices. Then graph the image of the figure after the indicated translation and write the coordinates of its vertices.**

A) Triangle *ABC* with vertices *A*(–3, –1), *B*(–4, –4), and *C*(–1, –2) translated 4 units right and 1 unit up **A' (1,0)** **B' (0,-3)** **C' (3,-1)**	
B) Triangle *XYZ* with vertices *X*(1, –2), *Y*(3, –5), and *Z*(4, 1) translated 5 units left and 3 units up **X' (-4,1)** **Y'(-2,-2)** **Z'(-1,4)**	
C) A rectangle *QRST* with vertices *Q*(–2, –4), *R*(–2, 1), *S*(–4, 1), and *T*(–4, –4) translated 3 units right and 3 units up **Q' (1,-1)** **R' (1,4)** **S' (-1,4)** **T' (-1,-1)**	

* **Graph the figure and its reflection over the *x*-axis. Then find the coordinates of the reflected image.**	* **Graph the figure and its reflection over the *y*-axis. Then find the coordinates of the reflected image.**
1. A triangle *ABC* with vertices *A*(–3, 4), *B*(1, 4), and *C*(3, 1)  A' (-3,-4) B' (1,-4) C' (3,-1)	**2.** A trapezoid *WXYZ* with vertices *W*(–1, 3), *X*(–1, –4), *Y*(–5, –4), and *Z*(–3, 3)  W' (1,3) X' (1,-4) Y' (5,-4) Z' (3,3)

*** Triangle *JKL* has vertices *J*(–3, 1), *K*(–1, 3), and *L*(–4, 2).**

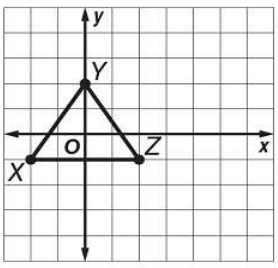
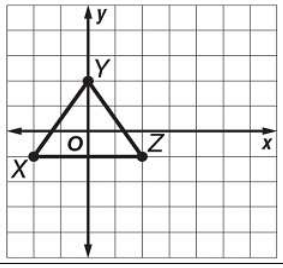


A) What are the coordinates of the image of point *J* after a reflection over the *y*-axis? J' (3,1)

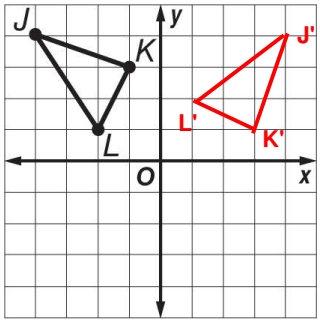
B) What are the coordinates of the image of point *K* after a reflection over the *y*-axis? K' (1,3)

c) What are the coordinates of the image of point *L* after a reflection over the *y*-axis? L' (4,2)

*** Graph ΔXYZ and its image after each rotation. Then give the coordinates of the vertices for $\Delta X'Y'Z'$.**

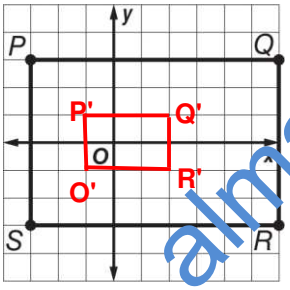
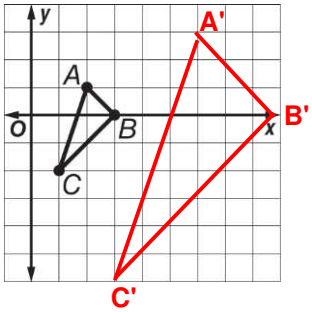
180° clockwise about vertex *Z*	90° clockwise about vertex *X*
 X' (6,-1) Y' (4, -4) Z' (2,-1)	 X' (-2,-1) Y' (1,-3) Z'(-2,-5)

* **Triangle *JKL* has vertices *J*(-4, 4), *K*(-1, 3), and *L*(-2, 1). Graph the figure and its rotated image after a clockwise rotation of 90° about the origin. Then give the coordinates of the vertices for triangle *J'K'L'*.**



J' (4 , 4)
K' (3 , 1)
L' (1 , 2)

* **Find the coordinates of the vertices of each figure after a dilation with the given scale factor *k*. Then graph the original image and the dilation.**

$P(-3, 3), Q(6, 3), R(6, -3), S(-3, -3); k = \frac{1}{3}$	$A(2, 1), B(3, 0), C(1, -2); k = 3$
	
P' (-1 , 1) Q' (2 , 1) R' (2 , -1) S' (-1 , -1)	A' (6 , 3) B' (9 , 0) C' (3 , -6)

Problem solving

A). Khalid used a photo that measured 4 cm by 6 cm to make a copy that measured 8 cm by 12 cm. What is the scale factor of the dilation?

4k = 8
k = 2 cm

OR

6k = 12
k = 2 cm

Chapter 7 (Congruence and Similarity)

*** Determine if the two figures are congruent by using transformations. Explain your reasoning.**

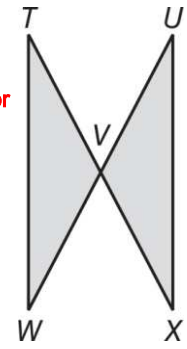
Δ TVW ≅ Δ UVX

∠T = ∠X
∠U = ∠W
alternate interior

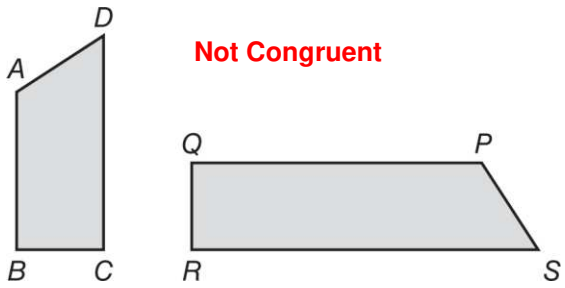
∠TVW = ∠UVX
vertical angles

TV = VX
UV = VW

SAS

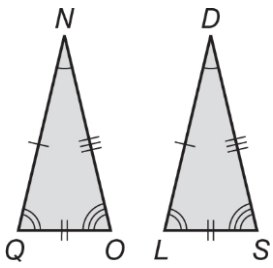


Reflection over a vertical line passing through V



Not Congruent

*** Write congruence statements comparing the corresponding parts in each set of congruent figures.**



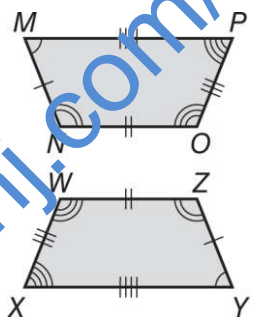
ΔNQO ≅ ΔDLS

NQ = DL
NO = DS
QO = LS

By SSS the two triangles are congruent

All corresponding sides are equal

All corresponding angles are equal

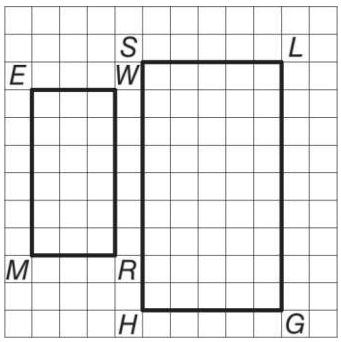


MNOP ≅ XWZY

All corresponding sides are equal

All corresponding angles are equal

*** Determine if the two figures are similar by using transformations. Explain your reasoning.**



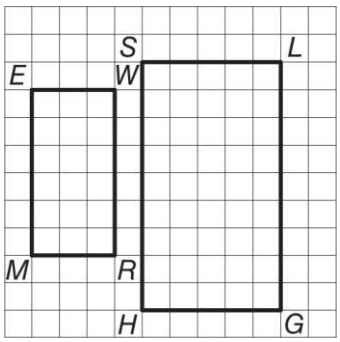
The two rectangles are not similar

Corresponding angles are congruent

but

corresponding sides are not proportional

5/3 = 5/3 ≠ 9/6 = 9/6



The two rectangles are not similar

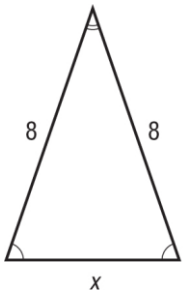
Corresponding angles are congruent

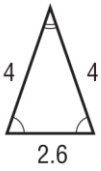
but

corresponding sides are not proportional

5/3 = 5/3 ≠ 9/6 = 9/6

*** Each pair of polygons is similar. Find each missing side measure:**





8/4 = 8/4 = x/2.6

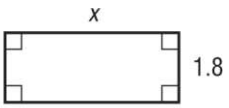
8/4 = x/2.6

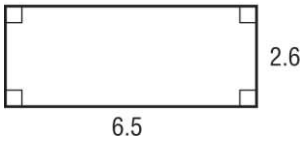
4x = (8)(2.6)

4x = 20.8

x = 20.8/4

x = 5.2

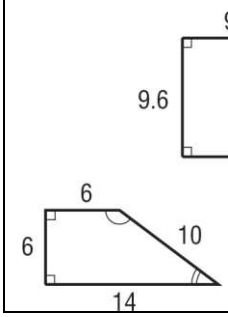




2.6 / 1.8 = 6.5 / x

(2.6)(x) = (6.5)(1.8)

x = 4.5



9.6/6 = 9.6/6 = 22.4/14 = x/10

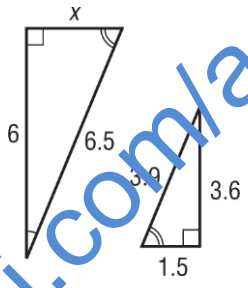
22.4/14 = x/10

(22.4)(10) = (14)(x)

224 = 14x

x= 224/14

x = 16



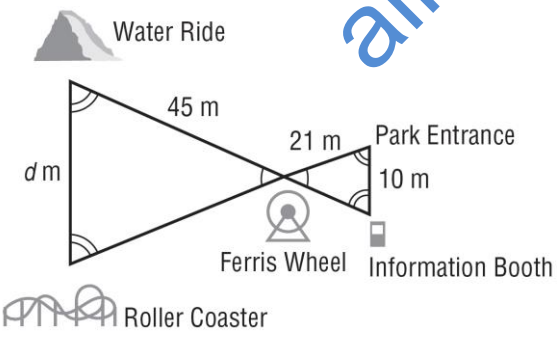
x/1.5 = 6/3.6

(x)(3.6) = (1.5)(6)

x = 2.5

*** The triangles are similar. Write a proportion and solve the problem.**

How far is the water ride from the roller coaster? Round to the nearest tenth.



45/21 = d/10

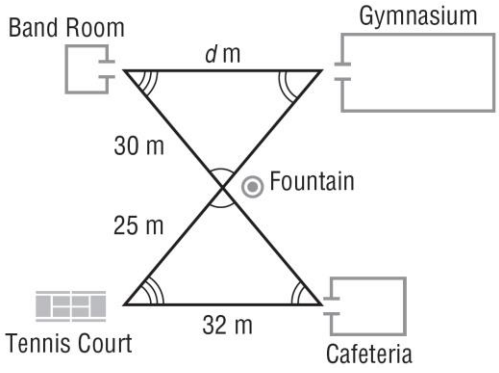
(45)(10) = (21)(d)

450 = 21d

d = 450 / 21

d = 21.4 m

How far is the entrance to the gymnasium from the band room?



30/25 = d/32

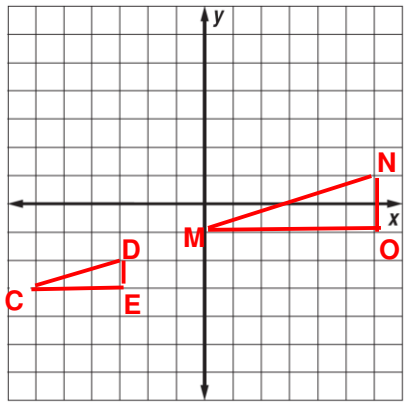
(30)(32) = (25)(d)

960 / 25 = d

d = 38.4

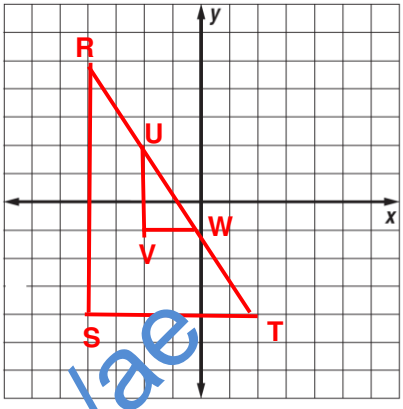
*** Graph each pair of similar triangles. Then write a proportion comparing the rise to the run for each of the similar slope triangles and find the numeric value.**

A) ΔCDE with vertices C(–6, –3), D(–3, –2), and E(–3, –3); ΔMNO with vertices M(0, –1), N(6, 1), and O(6, –1).



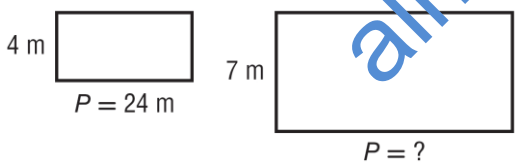
$\frac{\text{Rise}}{\text{Run}} \quad \frac{1}{3} = \frac{2}{6}$

B) ΔRST with vertices R(–4, 5), S(–4, –4), and T(2, –4); ΔUVW with vertices U(–2, 2), V(–2, –1), and W(0, –1).



$\frac{\text{Rise}}{\text{Run}} \quad \frac{-3}{2} = \frac{-9}{6}$

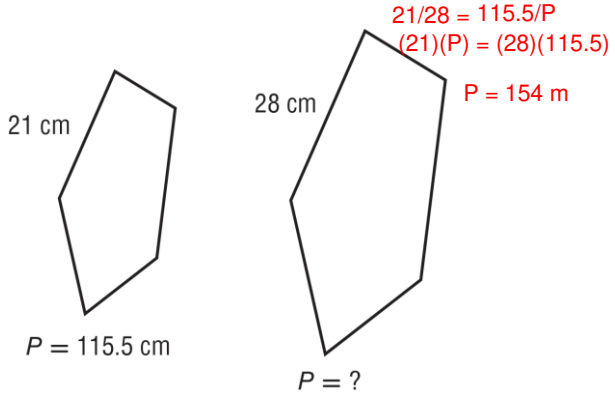
*** For each pair of similar figures, find the perimeter of the second figure.**



7/4 = p/24

(7)(24) = (4)(P)

p = 42 m



21/28 = 115.5/P

(21)(P) = (28)(115.5)

P = 154 m

Problem Solving:

A) A triangle has a side length of 3 meters and an area of 22 square meter. A similar triangle has a corresponding side length of 6 meters. Find the area of the larger triangle. $A = 88\ m^2$

B) A rectangle has a side length of 2 cm and an area of 10 cm^2. A similar rectangle has a corresponding side length of 6 cm. Find the area of the larger rectangle. $A = 90\ cm^2$

Chapter 8 (Volume and Surface Area)

Part 1

Choose the correct answer:

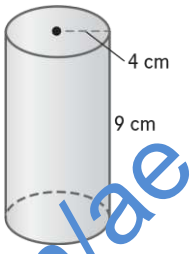
1. The radius of a cone is 17 cm long and the slant height is 20 cm. Find the surface area to the nearest tenth.

A) 18,158.4 cm^2 **B)** 1976.1 cm^2 **C)** 1068.1 cm^2 **D)** 340 cm^2

2. The volume of a cylinder is 62.8 cubic meters and the radius is 2 meters. Find the height of the cylinder. Round to the nearest meter.

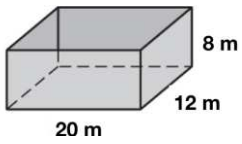
A) 20 m **B)** 10 m **C)** 8 m **D)** 5 m

3. Find the volume of the cylinder to the nearest tenth.



A) 150.8 cm^3 **B)** 603.2 cm^3
C) 452.4 cm^3 **D)** 1809.6 cm^3

5. Find the volume of the open box.

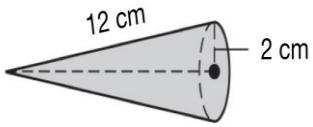


A) 1920 m^3 **B)** 752 m^3
C) 998 m^3 **D)** 400 m^3

6. Find the volume of a right cylinder with a diameter of 6 meters and a height of 17 meters. Round to the nearest tenth.

A) 160.2 m^3 **B)** 480.7 m^3 **C)** 640.9 m^3 **D)** 1922.7 m^3

7. Find the volume of the cone to the nearest tenth.

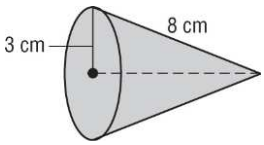


A) 49.6 cm^3 **B)** 88.0 cm^3
C) 75.4 cm^3 **D)** 100.5 cm^3

8. Find the volume of a right cylinder with a radius of 5 centimeters and a height of 22 centimeters. Round to the nearest tenth.

A) 576.0 cm^3 **B)** 1727.9 cm^3 **C)** 2303.8 cm^3 **D)** 6911.5 cm^3

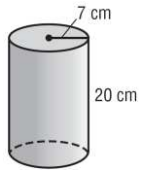
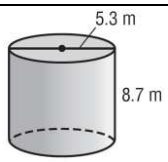
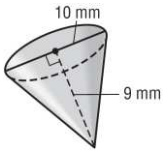
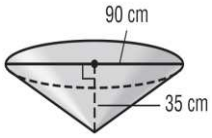
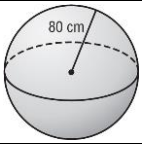
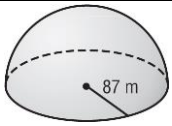
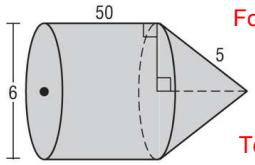
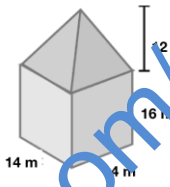
10. Find the volume of the cone to the nearest tenth.



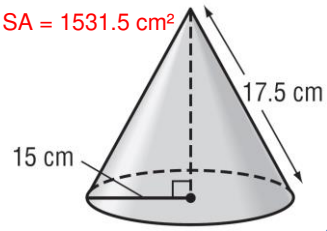
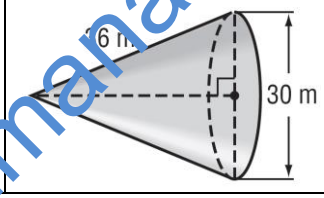
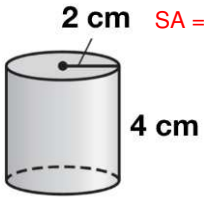
A) 50.3 cm^3 **B)** 209.7cm^3
C) 69.9 cm^3 **D)** 226.2 cm^3

Part 2

1) Find the volume of each shape. Round to the nearest tenth if necessary.

	$\pi r^2 h = (\pi)(49)(20) =$ 3078.8 cm³
	$\pi r^2 h = (\pi)(7.0225)(8.7) =$ 191.9 m³
	$(1/3)(\pi)(5^2)(9)=$ 235.6 mm³
	$(1/3)(\pi)(45^2)(35)=$ 74220.1 cm³
	$(4/3)(\pi)(80^3)$ 2144660.6 cm³
	$(1/2)(4/3)(\pi)(87^3)$ 1379165.5 m³
	For Cylinder: $(\pi)(3^2)(50)=1413.7$ For Cone: $(1/3)(\pi)(3^2)(4)$ = 37.7 Total V = 1413.7 + 37.7 = 1451.4
	For Prism: (14)(14)(16)=3136 For Pyramid: (1/3)(14)(14)(12)=784 Total V = 3136 +784 3920 m³

2) Find the total surface area of each cylinder. Round to the nearest tenth.

SA = 1531.5 cm² 	SA = 2403.3 m² 	 SA = 75.4 cm²

Problem Solving

1) A funnel is in the shape of a cone. The radius is 2 meters and the height is 4.6 meters. Find the volume of the funnel. Round to the nearest tenth. V = (1/3)(π)(2²)(4.6) = 19.3 m³

2) A cylindrical vase is 1.5 meters tall and has a diameter of 0.2 meters. Find the surface area of the vase. Round to the nearest tenth.

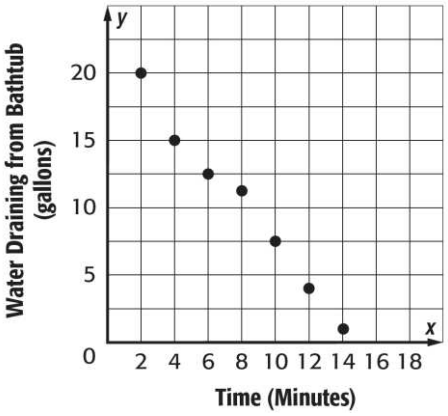
SA = 1.0 m²

3) The surface area of a triangular prism is 60 square centimeters. What is the surface area of a similar prism that is smaller by a scale factor of $\frac{1}{5}$? SA = 2.4 cm²

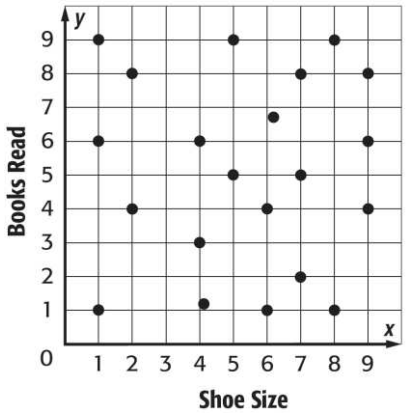
4) A cone has a volume of 7,560 cubic millimeters. What is the volume of a similar cone that is one sixth the size of this cone? V = 35 mm³

Chapter 9 (Scatter plot and Data Analysis)

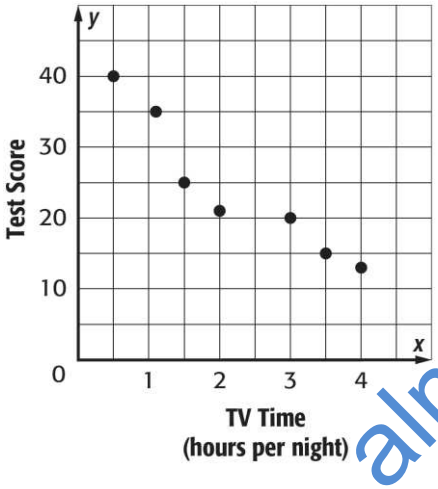
1) Explain whether the scatter plot of the data for each of the following shows a *positive*, *negative*, or *no* association. Interpret the scatter plot.



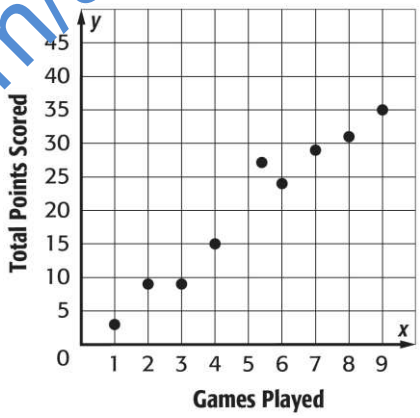
negative association



No association



negative association



positive association

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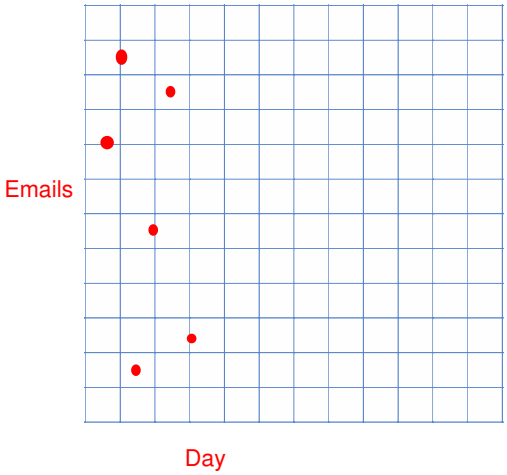
2) Construct a scatter plot of the number of E-mails Vincent received over the past six days. Interpret the scatter plot.

Day	1	2	3	4	5	6
E-mails	16	21	3	11	19	5



3) The table shows the resale value of six SUVs plotted against the age of the vehicle.

Age (yr)	1	2	3	4	5	6
Value (AED 1,000)	24	22	19	17	16	13

a. Construct a scatter plot of the data. Then draw and assess a line that seems to best represent the data.

b. Use the line of best fit to estimate the resale value of a 7-year-old SUV. around 12,000 AED

---

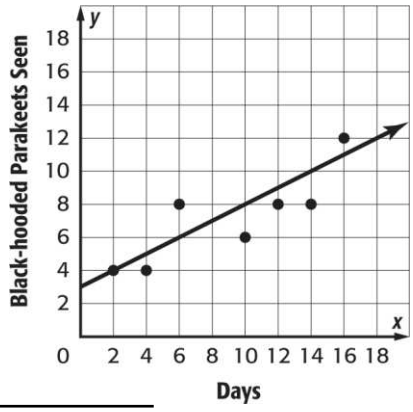
4) Jassim belongs to a bird-watching club. Every two days, he goes out and counts the number of Black-hooded Parakeets he sees. The scatter plot shows the number of parakeets he saw in the past 12 days.

a. Write an equation in slope-intercept form for the line that is drawn.

y = (1/2)x + 3

b. Use the equation to make a conjecture about the number of parakeets he saw on the eighteenth day.

y = (1/2)(18) + 3 = 12



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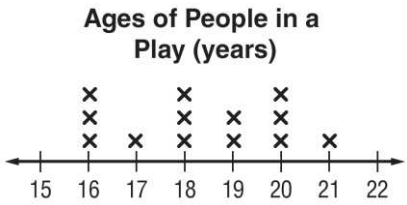
5) The graph shows the ages of people in a play.



1) Describe the shape of the distribution. Identify any clusters, gaps, peaks, or outliers.

The distribution of the data is Non-Symmetric.
There is a cluster from 18-20.
No Gap
No Outlier

2) Describe the center and spread of the distribution. Justify your response based on the shape of the distribution

Since the distribution is non-symmetrical, we'll use the median to describe the center and the IQR to describe the spread.
Median = 18 IQR = Q3 - Q1 = 20 - 16.5 = 3.5

So, the data is centered around the median of 18 years, and the spread of the data around the center is 3.5 years.

6) There are 195 male and 126 female students. A survey showed that 110 males and 84 females ride the bus.

	Bus	Not Bus	Total
Males	110	85	195
Females	84	42	126
Total	194	127	**321**

7) The two-way table shows the enrollment in language classes at a Middle School. Find and interpret the relative frequencies of students in the survey by row. Round to the nearest hundredth if necessary.

	Spanish	Not Spanish	Total
Chinese	30 = 30/95 = 0.32	65 = 65/95 = 0.68	95
Not Chinese	20 = 20/25 = 0.8	5 = 5/25 = 0.2	25

All relative frequency is in red

---

8) Find the mean, median, mode, and range of each data set.

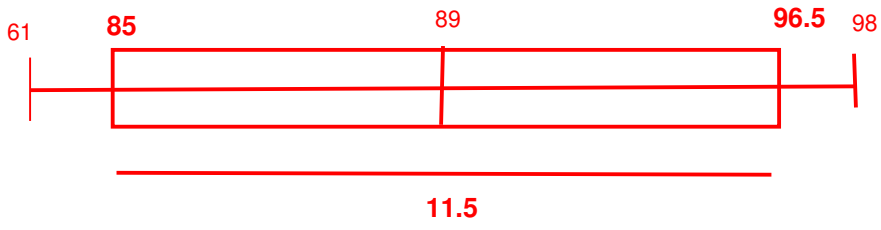
a. The points scored by a football team: 21, 24, 14, 14, 0, 16, 21, 28, 6, 20

Mean = 16.4
Median = 18
Mode = 14 and 21
Range = 28

b. Science quiz scores: 61, 96, 97, 87, 84, 91, 98, and 86

Mean = 87.5
Median = 89
Mode = None
Range = 37

9) Find the five-number summary of the data 61, 96, 97, 87, 84, 91, 98, and 86 . Draw a box plot of the data.



Min = 61 Max = 98
Median = 89
Lower Q = **85**
Upper Q = **96.5**
IQR = 11.5

10) Find the mean absolute deviation of each set of data. Round to the nearest tenth if necessary. Describe what the mean absolute deviation represents.

Basketball Scores				
41	37	50	38	46
54	42	56	49	47

If the standard deviation is about 6.5 points. Describe the data values that are within one standard deviation of the mean.

Mean = 46

46 - 6.5 = 39.5
46 + 6.5 = 52.5
The scores that are between 39.5 and 52.5 are within one standard deviation of the mean.

Books Read				
15	12	10	24	32
18	23	19	30	27

If the standard deviation is about 6.5 points. Describe the data values that are within one standard deviation of the mean.

Mean = 21

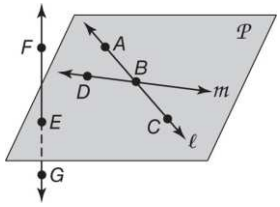
21 - 6.5 = 14.5
21 + 6.5 = 27.5
The number of books read that are between 14.5 and 27.5 are within one standard deviation of the mean.

Chapter 10 (Points, lines and planes)

Part 1

1. Name the geometric term modeled by a pinhole in a wall.
A) line segment **B)** plane **C)** line **D)** point

For Exercises 2 - 4, use the figure at the right.



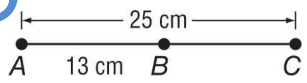
2. Which is another name for line ℓ?
A) $\overleftrightarrow{AB}$ **B)** $\overleftrightarrow{BD}$
C) C **D)** P

3. Name the intersection of lines ℓ and m.
A) A **B)** C
C) B **D)** P

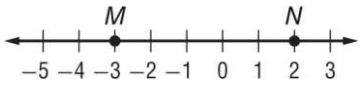
4. Name three points coplanar with point A.
A) B, C, F **B)** B, C, E **C)** E, F, G **D)** B, D, G

5. Given A is between Y and Z and $YA = 22$, $AZ = 16x$, and $YZ = 106$, find AZ.
A) 9 **B)** 22 **C)** 122 **D)** 144

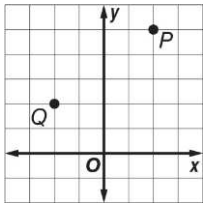
6. Find the length of $\overline{BC}$.
A) 12 cm **B)** 25 cm
C) 13 cm **D)** 38 cm



7. Use the number line to find MN.
A) –5 **B)** 5
C) 1 **D)** 10



8. Find the distance between points P and Q.
A) 5 **B)** 9
C) 7 **D)** 25



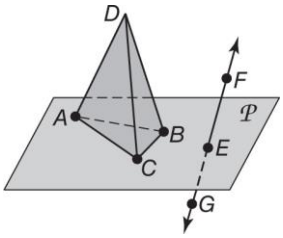
9. Which of the following is the most precise description for the net of a cylinder?

A) 1 square and 1 circle **B)** 1 rectangle and 1 circle
C) 2 squares and 1 circle **D)** 1 rectangle and 2 circles

10. The length of $\overline{RS}$ is 3.6 cm. Find the absolute error of the measurement.
A) 0.05 cm **B)** 0.1 cm **C)** 0.6 cm **D)** 6 cm

11. How many planes can be drawn through any three non-collinear points?
A) 0 **B)** 1 **C)** 2 **D)** 3

For Exercises 12 and 13, use the figure at the right.

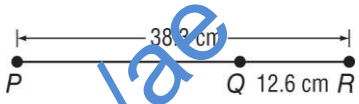


12. Which three points in the figure are collinear?
A) *A*, *B*, *D* **B)** *E*, *C*, *A*
C) *A*, *B*, *C* **D)** *F*, *E*, *G*

13. Name the intersection of the plane *P* and the plane that contains points *B*, *C*, and *D*.
A) point B **B)** $\overleftrightarrow{BC}$ **C)** $\overline{BD}$ **D)** $\Delta\, BCD$

14. Given *A* is between *Y* and *Z* and *YA* = 5.5, *AZ* = 2*x*, and *YZ* = 41.5, find *AZ*.
A) 9 **B)** 18 **C)** 36 **D)** 72

15. Find the length of $\overline{PQ}$.
A) 50.9 cm **B)** 25.7 cm
C) 46.3 cm **D)** 21.3 cm



16. Find the value of *y* if *B* is between *A* and *C*, *AB* = 2*y*, *BC* = 6*y*, and *AC* = 48.
A) 24 **B)** 8 **C)** 6 **D)** 4

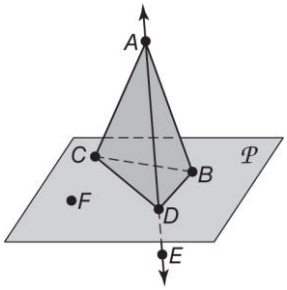
17. Find the distance between *P*(2, 8) and *Q*(5, 3).
A) 9 **B)** $\sqrt{18}$ **C)** $\sqrt{34}$ **D)** $\sqrt{170}$

18. Find the coordinates of the midpoint of $\overline{LB}$ if *L*(8, 5) and *B*(–6, 2).
A) (1, 3.5) **B)** (2, 1.5) **C)** (7, 3.5) **D)** (7, 1.5)

19. The length of a throw rug is 34 m. Find the relative error of the measurement.
A) 0.5 m. **B)** 1 m. **C)** ≈ 1.5% **D)** ≈ 2%

20. Suppose *A* and *B* are points. How many lines contain both *A* and *B*?
A) 0 **B)** 1 **C)** 2 **D)** 3

For Exercises 21 and 22, use the figure at the right.



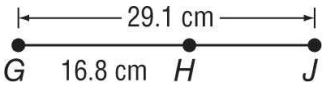
21. Which three points in the figure are collinear?
A) *C*, *D*, *F* **B)** *B*, *C*, *D*
C) *A*, *E*, *F* **D)** *A*, *D*, *E*

22. Name the intersection of the plane that contains points *A*, *B*, and *D* and the plane *P*.
A) point *D* **B)** $\overline{AD}$
C) triangle *BCD* **D)** $\overleftrightarrow{BD}$

23. Given A is between Y and Z and $YA = 14x$, $AZ = 10x$ and $YZ = 12x + 48$, find AZ.

A) 4 **B)** 40 **C)** 56 **D)** 96

24. Find the length of $\overline{HJ}$.



A) 11.3 cm **C)** 13.7 cm
B) 12.3 cm **D)** 45.9 cm

25. Find the value of x if S is between R and T, $RS = x + 3$, $ST = 5x$, and $RT = 57$.

A) 9 **B)** 10 **C)** 10.8 **D)** 12

26. Find the distance between $M(-2, 3)$ and $N(8, 2)$.

A) 8 **B)** $\sqrt{61}$ **C)** 10 **D)** $\sqrt{101}$

27. Find the coordinates of the midpoint of $\overline{AS}$ if $A(-4, 7)$ and $S(5, -3)$.

A) (1, 10) **B)** $(-4\frac{1}{2}, 2)$ **C)** $(\frac{1}{2}, 5)$ **D)** $(-\frac{1}{2}, 5)$

28. The length of a box is 28 cm. Find the relative error of the measurement.

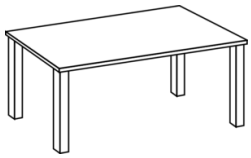
A) 0.5 cm. **B)** 1 cm. **C)** ≈ 1.8% **D)** ≈ 2.4%

29. Which of the following is *not* an undefined term in geometry?

A) plane **B)** point **C)** bisector **D)** line

30. Which undefined term is best modeled by the tabletop?

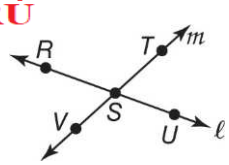
A) line **B)** plane
C) point **D)** segment



Part 2

For Questions 1-3, use the figure at the right.

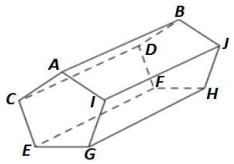
1. What is another name for line ℓ? $\overleftrightarrow{RS}$, $\overleftrightarrow{SU}$, $\overleftrightarrow{RU}$



2. Name the intersection of lines ℓ and m. Point S

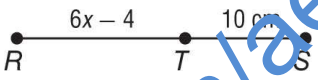
3. Name three collinear points. **R, S, U or V, S, T**

4. How many planes are shown in the figure? 7



5. Find the length of $\overline{UW}$ if W is between U and V, $UV = 16.8$ centimeters, and $VW = 7.9$ centimeters. UW = 8.9

6. Find the value of x if $RS = 24$ centimeters. x = 3



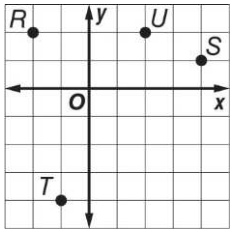
7. Find the length of $\overline{LO}$ if M is between L and O, $LM = 7x - 9$, $MO = 14$ cm, and $LO = 10x - 7$. x = 4 so LO = 33

8. Find the value of x if $\overline{PQ} \cong \overline{RS}$, $PQ = 9x - 7$, and $RS = 29$. x = 4

9. Find the coordinates of the midpoint of $\overline{AB}$ for $A(2, 5)$ and $B(6, 9)$. Mid-Point = (4, 7)

10. Find the coordinates of D if E is the midpoint of $\overline{CD}$, for $C(-3, 4)$ and $E(0, 1)$. D = (3, -2)

For Exercises 11-13, use the coordinate grid.

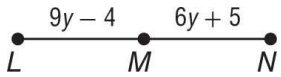


11. Find the distance between R and S. d = √37

12. Find the coordinates of the midpoint of $\overline{TU}$. Mid point = (0.5 , -1)

13. Find the coordinates of a point M given that U is the midpoint of $\overline{MS}$. M = (0 , 3)

14. Find the value of y if M is the midpoint of $\overline{LN}$.



9y - 4 = 6y + 5
9y - 6y = 5+4 y = 3

15. Find the absolute error of a length of string that measures 7.5 inches. (0.1) x (0.5) = 0.05

16. Determine the number of significant digits in 2.304 kg. Number of significant digits = 4

Chapter 11 (Quadrilaterals)

Part 1

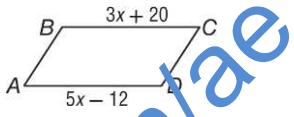
Choose the correct answer:

1. Find the sum of the measures of the interior angles of a convex 30-gon.
A) 5400° **B)** 5040° **C)** 360° **D)** 168°

2. Find the sum of the measures of the exterior angles of a convex 21-gon.
A) 21° **B)** 180° **C)** 360° **D)** 3420°

3. If the measure of each interior angle of a regular polygon is 108°, find the measure of each exterior angle.
A) 18° **B)** 72° **C)** 90° **D)** 108°

4. For parallelogram *ABCD*, find the value of *x*.
A) 4 **B)** 16
C) 10.25 **D)** 21.5

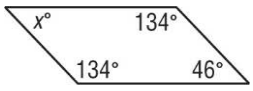


5. Which of the following is a property of a parallelogram?
A) The diagonals are congruent. **B)** The diagonals are perpendicular.
C) The diagonals bisect the angles. **D)** The diagonals bisect each other.

6. *ABCD* is a parallelogram with coordinates *A*(4, 2), *B*(4, –1), *C*(–2, –1), and *D*(–2, 2). To prove that *ABCD* is a rectangle, you would plot the parallelogram on a coordinate plane and then find which of the following?
A) measures of the angles **B)** slopes of the diagonals
C) lengths of the diagonals **D)** midpoints of the diagonals

7. Find the value of *x* so that this quadrilateral is a parallelogram.

A) 44 **B)** 90
C) 46 **D)** 134



8. Parallelogram *ABCD* has vertices *A*(0, 0), *B*(2, 4), and *C*(10, 4). Find the coordinates of *D*.
A) *D*(8, 0) **B)** *D*(10, 0) **C)** *D*(0, 4) **D)** *D*(10, 8)

9. Which of the following is a property of all rectangles?
A) four congruent sides **B)** diagonals are perpendicular
C) diagonals bisect the angles **D)** four right angles

10. *ABCD* is a rectangle with diagonals $\overline{AC}$ and $\overline{BD}$. If $AC = 2x + 10$ and $BD = 56$, find the value of x.

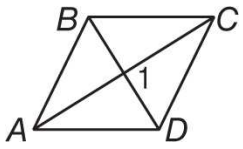
A) 23 **B)** 33 **C)** 78 **D)** 122

11. *ABCD* is a rectangle with $B(-5, 0)$, $C(7, 0)$ and $D(7, 3)$. Find the coordinates of A.

A) $A(-5, 7)$ **B)** $A(3, 5)$ **C)** $A(-5, 3)$ **D)** $A(7, -3)$

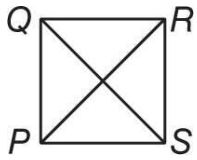
12. For rhombus *ABCD*, find $m\angle 1$.

A) 45° **B)** 90°
C) 60° **D)** 120°



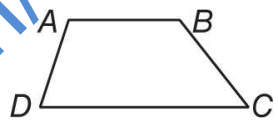
13. Find $m\angle PRS$ in square *PQRS*.

A) 30° **B)** 60°
C) 45° **D)** 90°



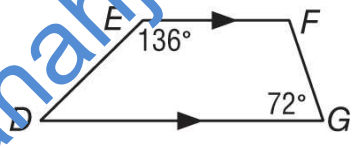
14. Choose a pair of base angles of trapezoid *ABCD*.

A) $\angle A, \angle C$ **B)** $\angle A, \angle D$
C) $\angle B, \angle D$ **D)** $\angle D, \angle C$



15. In trapezoid *DEFG*, find $m\angle D$.

A) 44° **B)** 108°
C) 72° **D)** 136°



16. On a coordinate plane, the four corners of Ahmad's garden are located at (0, 2), (4, 6), (8, 2), and (4, –2). Which of the following most accurately describes the shape of Ahmad's garden?

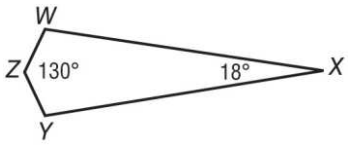
A) square **B)** rhombus
C) rectangle **D)** trapezoid

17. The length of one base of a trapezoid is 44, the length of the mid-segment is 36, and the other base is $2x + 10$. Find the value of x.

A) 9 **B)** 17 **C)** 21 **D)** 40

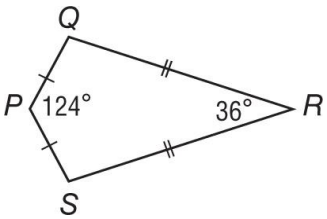
18. For kite *WXYZ*, find $m\angle W$.

A) 106° **C)** 212°
B) 148° **D)** 360°



19. *PQRS* is a kite. Find $m\angle S$.

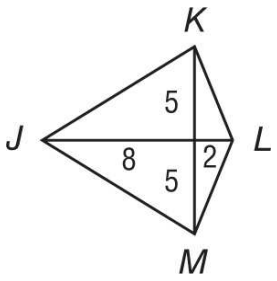
A) 100 **C)** 200°
B) 160° **D)** 360°



20. *JKLM* is a kite, find *JM*.

A) $\sqrt{29}$ **B)** $\sqrt{13}$

C) $\sqrt{89}$ **D)** 11



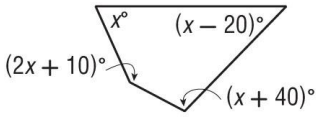
21. Find the sum of the measures of the interior angles of a convex 45-gon.

A) 8100° **B)** 7740° **C)** 360° **D)** 172°

22. Find the value of *x*.

A) 30 **B)** 102

C) 66 **D)** 138



23. Find the sum of the measures of the exterior angles of a convex 39-gon.

A) 39° **B)** 90° **C)** 180° **D)** 360°

24. Which of the following is a property of all parallelograms?

A) Each pair of opposite sides is congruent.

B) Only one pair of opposite angles is congruent.

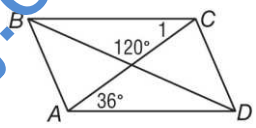
C) Each pair of opposite angles is supplementary.

D) There are four right angles.

25. For parallelogram *ABCD*, find $m\angle 1$.

A) 60° **B)** 36°

C) 54° **D)** 18°



26. *ABCD* is a parallelogram with diagonals intersecting at *E*. If $AE = 3x + 12$ and $EC = 27$, find the value of *x*.

A) 5 **B)** 17 **C)** 27 **D)** 47

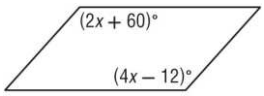
27. The length of one base of a trapezoid is 19 meters and the length of the mid segment is 23 meters. Find the length of the other base.

A) 15 m **B)** 21 m **C)** 27 m **D)** 42 m

28. Find the value of *x* so that this quadrilateral is a parallelogram.

A) 12 **B)** 36

C) 24 **D)** 132



29. Parallelogram *ABCD* has vertices *A*(8, 2), *B*(6, –4), and *C*(–5, –4). Find the coordinates of *D*.

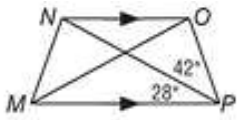
A) *D*(–5, 2) **B)** *D*(–3, 2) **C)** *D*(–2, 2) **D)** *D*(–4, 8)

30. *ABCD* is a rectangle. If $AC = 5x + 2$ and $BD = x + 22$, find the value of x.

A) 5 **B)** 6 **C)** 11 **D)** 26

31. For isosceles trapezoid *MNOP*, find $m\angle MNP$.

A) 42° **B)** 82°
C) 70° **D)** 98°

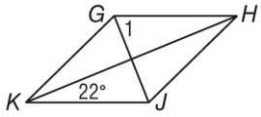


32. *ABCD* is a rectangle with *B*(–4, 6), *C*(–4, 2), and *D*(10, 2). Find the coordinates of *A*.

A) *A*(6, 4) **B)** *A*(10, 4) **C)** *A*(2, 6) **D)** *A*(10, 6)

33. For rhombus *GHJK*, find $m\angle 1$.

A) 22° **B)** 68°
C) 44° **D)** 90°



34. The diagonals of square *ABCD* intersect at *E*. If $AE = 2x + 6$ and $BD = 6x - 10$, find *AC*.

A) 11 **B)** 28 **C)** 56 **D)** 90

35. *ABCD* is an isosceles trapezoid with *A*(10, -1), *B*(8, 3), and *C*(-1, 3). Find the coordinates of *D*.

A) *D*(–3, –1) **B)** *D*(–10, –11) **C)** *D*(–1, 8) **D)** *D*(–3, 3)

36. *ABCD* is an isosceles trapezoid with *A*(0, –1), *B*(–2, 3), and *D*(6, –1). Find the coordinates of *C*.

A) *C*(6, 1) **B)** *C*(9, 4) **C)** *C*(2, 3) **D)** *C*(8, 3)

37. The length of one base of a trapezoid is 19 cm and the length of the mid-segment is 16 cm. Find the length of the other base.

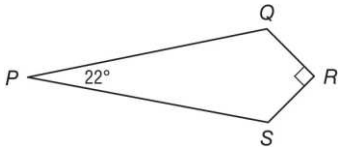
A) 35 cm. **B)** 19 cm. **C)** 17.5 cm. **D)** 13 cm.

38. Khalid built a fence to surround her property. On a coordinate plane, the four corners of the fence are located at (–16, 1), (–6, 5), (4, 1), and (–6, –3). Which of the following most accurately describes the shape of Khalid's fence?

A) square **B)** rhombus
C) rectangle **D)** trapezoid

39. For kite *PQRS*, find $m\angle S$.

A) 248° **B)** 112°
C) 68° **D)** 124°



40. The diagonals of square *ABCD* intersect at *E*. If $AE = 3x - 4$ and $BD = 10x - 48$, find *AC*.

A) 90 **B)** 52 **C)** 26 **D)** 10

Part 2

For Questions 1-7, write *true* or *false*.

1. A rectangle is always a parallelogram. True

2. The diagonals of a rhombus are always perpendicular. True

3. The diagonals of a square always bisect each other. True

4. A trapezoid always has two congruent sides. False

5. The median of a trapezoid is always parallel to the bases. True

6. A kite has exactly two congruent angles. True - (one pair of opposite angles are congruent)

7. If the diagonals of a parallelogram are perpendicular, then the parallelogram is a rectangle. False

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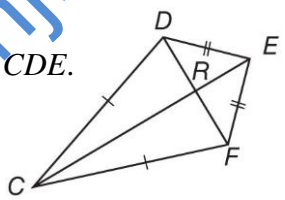
For Questions 1 and 2, refer to kite *DEFC*.



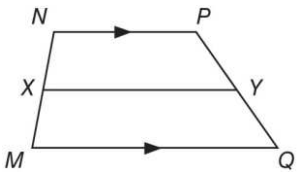
1. If $m\angle DCF = 34$ and $m\angle DEF = 90$, find $m\angle CDE$.

m ∠ CDE = 118

2. If $DR = 5$ and $RE = 5$, find FE.

FE = √50

For Questions 3 and 4, refer to trapezoid *NPQM* where *X* and *Y* are midpoints of the sides.



3. If $MQ = 15$ and $XY = 10$, find NP.

NP = 5

4. If $NP = 13$ and $MQ = 18$, find XY.

XY = 15.5

Answer the following questions:

1) If *CDEF* is a trapezoid with vertices $C(0, 2)$, $D(2, 4)$, $E(7, 3)$, and $F(1, -3)$, how can you prove that it is an isosceles trapezoid?

leg CF ≅ leg DE = √26

2) A convex pentagon has interior angles with measures $(5x - 12)°$, $(2x + 100)°$, $(4x + 16)°$, $(6x + 15)°$, and $(3x + 41)°$. Find the value of x. x = 19

3) Find the measure of each exterior angle of a regular 45-gon.

msr of each exterior angle = 360/45 = 8

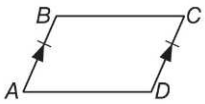
4) In parallelogram $ABCD$, $m\angle A = 58$. Find $m\angle B$.

m ∠ B = 122

5) Find the coordinates of the intersection of the diagonals of parallelogram $XYZW$ with vertices $X(2, 2)$, $Y(3, 6)$, $Z(10, 6)$, and $W(9, 2)$.

Point of intersection = (6 , 4)

6) Determine whether $ABCD$ is a parallelogram. Justify your answer.



AB ∥ CD

AB ≅ CD

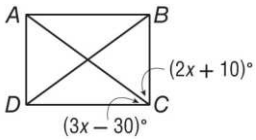
7) Determine whether the quadrilateral with vertices $A(5, 7)$, $B(1, -2)$, $C(-6, -3)$, and $D(2, 5)$ is a parallelogram. Use the slope formula.

Not a parallelogram, opposite sides are not congruent

$AB = \sqrt{97}$

$CD = \sqrt{128}$

8) Given rectangle $ABCD$, find the value of x.



x = 22

9) $ABCD$ is a parallelogram and $\overline{AC} \cong \overline{BD}$. Determine whether $ABCD$ is a rectangle. Justify your answer.

ABCD is a rectangle if diagonals AC is congruent to BD

10) $ABCD$ is a rhombus with diagonals intersecting at E. If $m\angle ABC$ is three times $m\angle BAD$, find $m\angle EBC$.

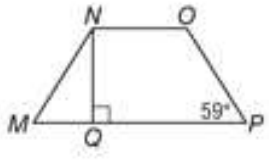
m ∠ BEC = 90
if m ∠ BAD = x
and m of opp ∠BCD = x
so m ∠ABC = 3x
then m ∠ EBC = (3/2)x

(1/2)x + (3/2)x + 90 = 180
x = 45
m∠EBC = 67.5

11) $TUVW$ is a square with $U(10, 2)$, $V(8, 8)$, and $W(2, 6)$. Find the coordinates of T.

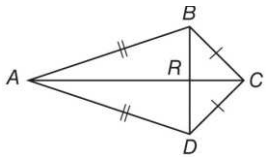
T = (4,0)

12) For isosceles trapezoid *MNOP*, find $m\angle MNQ$.



∠NMP = 59 ∠MQN = 90 ∠MNQ = 31

13). *ABCD* is a kite, If *RC* = 10, and *BD* = 48, find *CD*.



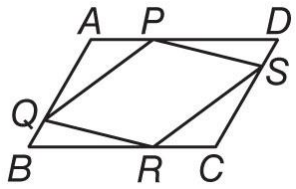
CD = 26

14) Find missing information for each corresponding location.

Given: *ABCD* is a parallelogram.

$\overline{BQ} \cong \overline{DS}$, $\overline{PA} \cong \overline{RC}$

Prove: *PQRS* is a parallelogram.



Statements	**Reasons**
1. *ABCD* is a ▱ .	**1.** Given
2. $\overline{AD} \cong \overline{CB}$	**2.** (Opposite sides) of a parallelogram are congruent
3. $\overline{PA} \cong \overline{RC}$	**3.** Given
4. $\overline{PD} \cong \overline{RB}$	**4.** Seg. Sub. Prop.
5. $\overline{AB} \cong \overline{CD}$	**5.** Opp. sides of a ▱ are ≅.
6. $\overline{BQ} \cong \overline{DS}$	**6.** Given
7. $\overline{AQ} \cong \overline{CS}$	**7.** Seg. Sub. Prop.
8. $\angle B \cong \angle D$, $\angle A \cong \angle C$	**8.** Opp. ∡s of a ▱ are ≅.
9. $\triangle QBR \cong \triangle SDP$, $\triangle PAQ \cong \triangle RCS$	**9.** SAS
10. $\overline{QP} \cong \overline{RS}$, $\overline{QR} \cong \overline{PS}$	**10.** corresponding parts of congruent triangles are congruent
11. *PQRS* is a parallelogram.	**11.** Both pairs of opposite sides are congruent