

شكراً لتحميلك هذا الملف من موقع المناهج الإماراتية



تجميع أسئلة وفق الهيكل الوزاري منهج ريفيل

موقع المناهج ← المناهج الإماراتية ← الصف العاشر المتقدم ← رياضيات ← الفصل الأول ← الملف

تاريخ نشر الملف على موقع المناهج: 09:07:51 2023-11-08

التواصل الاجتماعي بحسب الصف العاشر المتقدم



المزيد من الملفات بحسب الصف العاشر المتقدم والمادة رياضيات في الفصل الأول

نموذج الهيكل الوزاري الجديد ريفيل	1
نموذج الهيكل الوزاري الجديد بريدج	2
ورقة عمل الدرس السابع ضرب المصفوفات	3
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Multiple Choice Questions

Q1

Subtract polynomials

15 to 26

Pg 635

Find each sum or difference.

15. $(2x + 3y) + (4x + 9y)$

16. $(6s + 5t) + (4t + 8s)$

17. $(5a + 9b) - (2a + 4b)$

18. $(11m - 7n) - (2m + 6n)$

19. $(m^2 - m) + (2m + m^2)$

20. $(x^2 - 3x) - (2x^2 + 5x)$

21. $(d^2 - d + 5) - (2d + 5)$

22. $(2h^2 - 5h) + (7h - 3h^2)$

23. $(5f + g - 2) + (-2f + 3)$

24. $(6k^2 + 2k + 9) + (4k^2 - 5k)$

25. $(2c^2 + 6c + 4) + (5c^2 - 7)$

26. $(2x + 3x^2) - (7 - 8x^2)$

Examples 1–3

Find each product.

1. $(3c - 5)(c + 3)$

2. $(g + 10)(2g - 5)$

3. $(6a + 5)(5a + 3)$

4. $(4x + 1)(6x + 3)$

5. $(5y - 4)(3y - 1)$

6. $(6d - 5)(4d - 7)$

7. $(3m + 5)(2m + 3)$

8. $(7n - 6)(7n - 6)$

9. $(12t - 5)(12t + 5)$

10. $(5r + 7)(5r - 7)$

11. $(8w + 4x)(5w - 6x)$

12. $(11z - 5y)(3z + 2y)$

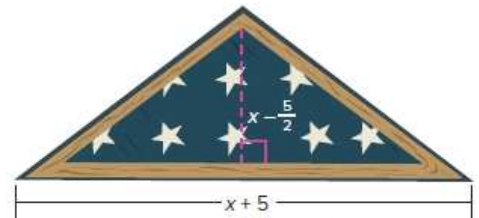
Example 4

13. **PLAYGROUND** The dimensions of a playground are represented by a width of $9x + 1$ feet and a length of $5x - 2$ feet. Write an expression that represents the area of the playground.

14. **THEATER** The Loft Theater has a center seating section with $3c + 8$ rows and $4c - 1$ seats in each row. Write an expression for the total number of seats in the center section.

15. **CRAFTS** Suppose a rectangular quilt made up of squares has a length-to-width ratio of 5 to 4. The length of the quilt is $5x$ inches. The quilt can be made slightly larger by adding a border of 1-inch squares all the way around the perimeter of the quilt. Write a polynomial expression for the area of the larger quilt.

16. **FLAG CASE** A United States flag is sometimes folded into a triangle shape and displayed in a triangular display case. If a display case has dimensions shown in inches, write a polynomial expression that represents the area of wall space covered by the display case.



Source: American Flag Store

17. **NUMBER THEORY** Think of a whole number. Subtract 2. Write down this number. Take the original number and add 2. Write down this number. Find the product of the numbers you wrote down. Subtract the square of the original number. The result is always -4 . Use polynomials to show how this number trick works.

Example 5

Find each product.

18. $(2y - 11)(y^2 - 3y + 2)$

19. $(4a + 7)(9a^2 + 2a - 7)$

20. $(m^2 - 5m + 4)(m^2 + 7m - 3)$

21. $(x^2 + 5x - 1)(5x^2 - 6x + 1)$

22. $(3b^3 - 4b - 7)(2b^2 - b - 9)$

23. $(6z^2 - 5z - 2)(3z^3 - 2z - 4)$

Examples 1 and 3**Find each product.**

1. $(a + 10)(a - 10)$

2. $(b - 6)(b - 6)$

3. $(h + 7)^2$

4. $(x + 6)^2$

5. $(8 - m)^2$

6. $(9 - 2y)^2$

7. $(2b + 3)^2$

8. $(5t - 2)^2$

9. $(8h - 4n)^2$

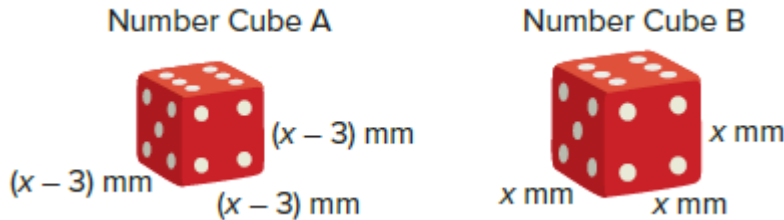
10. $(4m - 5n)^2$

Example 2

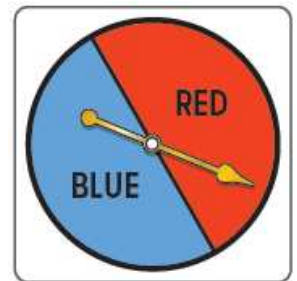
11. **ROUNDBABOUTS** A city planner is proposing a roundabout to improve traffic flow at a busy intersection. Write a polynomial equation for the area A of the traffic circle if the radius of the outer circle is r and the width of the road is 18 feet.



12. **NUMBER CUBES** Kivon has two number cubes. Each edge of number cube A is 3 millimeters less than each edge of number cube B. Each edge of number cube B is x millimeters. Write an equation that models the surface area of number cube A.



13. **PROBABILITY** The spinner has two equal sections, blue (B) and red (R). Use the square of a sum to determine the possible combinations of spinning the spinner two times.



14. **BUSINESS** The Combo Lock Company finds that its profit data from 2015 to the present can be modeled by the function $y = (2n + 11)^2$, where y is the profit, in thousands of dollars, n years since 2015. Which special product does this polynomial demonstrate? Simplify the polynomial.

Examples 3 and 4

Factor each polynomial.

11. $fg - 5g + 4f - 20$

12. $a^2 - 4a - 24 + 6a$

13. $hj - 2h + 5j - 10$

14. $xy - 2x - 2 + y$

15. $45pq - 27q - 50p + 30$

16. $24ty - 18t + 4y - 3$

17. $3dt - 21d + 35 - 5t$

18. $8r^2 + 12r$

19. $21th - 3t - 35h + 5$

20. $vp + 12v + 8p + 96$

21. $5br - 25b + 2r - 10$

22. $2nu - 8u + 3n - 12$

23. $b^2 - 2b + 3b - 6$

24. $2j^2 + 2j + 3j + 3$

25. $2a^2 - 4a + a - 2$

Examples 4 and 5

Determine whether each trinomial is a perfect square trinomial. Write *yes* or *no*. If so, factor it.

18. $4x^2 - 42x + 110$

19. $16x^2 - 56x + 49$

20. $81x^2 - 90x + 25$

21. $x^2 + 26x + 168$

Mixed Exercises

Factor each polynomial, if possible. If the polynomial cannot be factored using integers, write *prime*.

22. $36t^2 - 24t + 4$

23. $4h^2 - 56$

24. $17a^2 - 24ab$

25. $q^2 - 14q + 36$

26. $y^2 + 24y + 144$

27. $6d^2 - 96$

28. $1 - 49d^2$

29. $-16 + p^2$

30. $k^2 + 25$

31. $36 - 100w^2$

32. $64m^2 - 9y^2$

33. $4h^2 - 25g^2$

34. $x^3 + 3x^2 - 4x - 12$

35. $8x^2 - 72p^2$

36. $20q^2 - 5r^2$

37. $32a^2 - 50b^2$

38. $16b^2 - 100$

39. $49x^2 - 64y^2$

40. $3n^4 - 42n^3 + 147n^2$

41. $8m^3 - 24m^2 + 18m$

Examples 1 and 2

Factor each polynomial.

1. $q^2 - 121$

2. $r^4 - k^4$

3. $w^4 - 625$

4. $r^2 - 9t^2$

5. $h^4 - 256$

6. $2x^3 - x^2 - 162x + 81$

7. $x^2 - 4y^2$

8. $3c^3 + 2c^2 - 147c - 98$

9. $f^3 + 2f^2 - 64f - 128$

10. $r^3 - 5r^2 - 100r + 500$

11. $3t^3 - 7t^2 - 3t + 7$

12. $a^2 - 49$

13. $4m^3 + 9m^2 - 36m - 81$

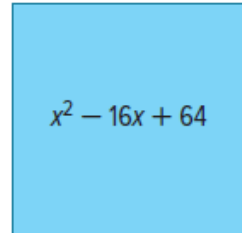
14. $3x^3 + x^2 - 75x - 25$

Example 3

15. **TICKETING** A ticketing company for sporting events analyzes the ticket purchasing patterns. The expression $9a^2 - 4b^2$ is developed to help officials calculate the likely number of people who will buy tickets for a certain sporting event. Factor the expression.

16. **BINGO** A bingo card contains 25 square spaces arranged into a larger square. 24 of the squares are labeled with numbers and the center square is labeled as a free space. The expression $16 - x^2$ represents total area of the squares labeled with numbers. Factor the expression.

17. **DECORATING** Marvin saw a rug in a store that he would like to purchase. It has an area represented by the expression shown on the rug. He cannot remember the length and width, but he remembers that the length and the width were the same.



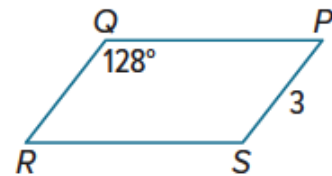
- Factor the expression that represents the area of the rug.
- What do the factors in the factored expression represent?

Q7	<i>Prove and use theorems about the properties of parallelograms</i>	1 to 8	Pg 71
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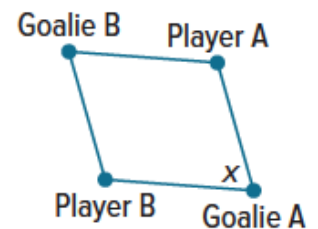
Example 1

Use $\square PQRS$ to find each measure.

- $m\angle R$
- QR
- QP
- $m\angle S$



5. **SOCCER** Four soccer players are practicing a drill. Goalie A is facing Player B to receive the ball. Goalie A then turns x° to face Player A to pass her the ball. If Goalie B is facing Player A to receive the ball, then through what angle measure should Goalie B turn to pass the ball to Player B?

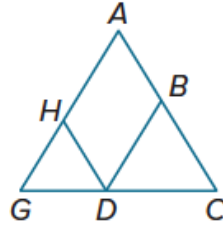


Example 2

PROOF For 6-7, Write a two-column proof.

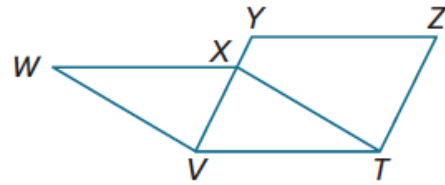
6. **Given:** $\square BDHA$, $\overline{CA} \cong \overline{CG}$

Prove: $\angle BDH \cong \angle G$



7. **Given:** $WXYZ$ and $YZTV$ are parallelograms.

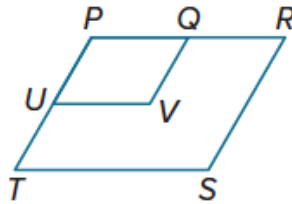
Prove: $\overline{WX} \cong \overline{YZ}$



8. Write a paragraph proof.

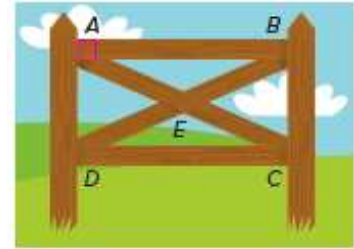
Given: $\square PRST$ and $\square PQVU$

Prove: $\angle V \cong \angle S$



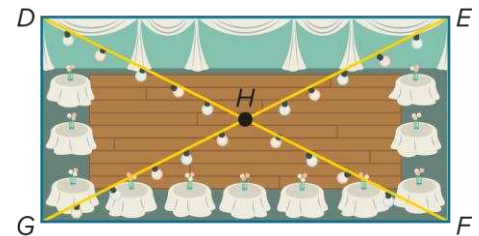
Example 1

FENCING X-braces are also used to provide support in rectangular fencing. If $AB = 6$ feet, $AD = 2$ feet, and $m\angle DAE = 65^\circ$, find each measure. Round to the nearest tenth, if necessary.



1. BC
2. DB
3. $m\angle CEB$
4. $m\angle EDC$

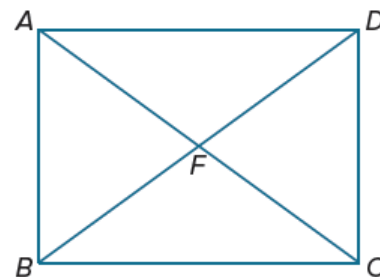
PROM The prom committee is decorating the venue for prom and wants to hang lights above the diagonals of the rectangular room. If $DH = 44.5$ feet, $EF = 39$ feet, and $m\angle GHF = 128^\circ$, find each measure.



5. DG
6. GE
7. $m\angle EHF$
8. $m\angle HEF$

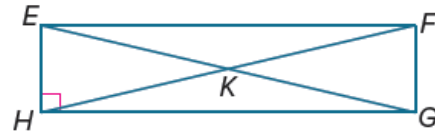
Example 2

9. Quadrilateral $ABCD$ is a rectangle.
If $m\angle ADB = (4x + 8)^\circ$ and $m\angle DBA = (6x + 12)^\circ$,
find the value of x .



Quadrilateral $EFGH$ is a rectangle. Use the given information to find each measure.

10. If $m\angle FEG = 57^\circ$, find $m\angle GEH$.



11. If $m\angle HGE = 13^\circ$, find $m\angle FGE$.

12. If $FK = 32$ feet, find EG .

13. Find $m\angle HEF + m\angle EFG$.

14. If $EF = 4x - 6$ and $HG = x + 3$, find EF .

Q9

Recognize and apply the properties of rhombi and squares

1 to 10

Pg 95

Examples 1 and 2

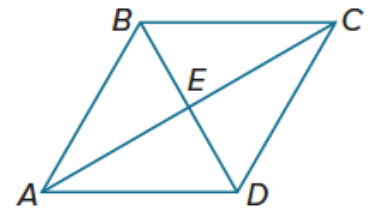
Quadrilateral $ABCD$ is a rhombus. Find each value or measure.

1. If $m\angle ABD = 60^\circ$, find $m\angle BDC$.

2. If $AE = 8$, find AC .

3. If $AB = 26$ and $BD = 20$, find AE .

4. Find $m\angle CEB$.



5. If $m\angle CBD = 58^\circ$, find $m\angle ACB$.

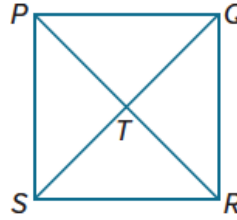
6. If $AE = 3x - 1$ and $AC = 16$, find x .

7. If $m\angle CDB = 6y^\circ$ and $m\angle ACB = (2y + 10)^\circ$, find the value of y .

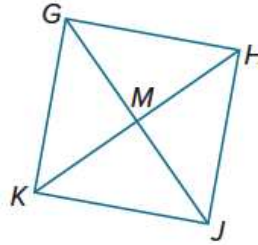
8. If $AD = 2x + 4$ and $CD = 4x - 4$, find the value of x .

Example 3

9. $PQRS$ is a square. If $PR = 42$, find TR .



10. $GHIK$ is a square. If $KM = 26.5$, find KH .



Apply the properties of trapezoids and use coordinate geometry to find lengths and endpoints of midsegments

Q10

1 to 12

Pg 105, 106

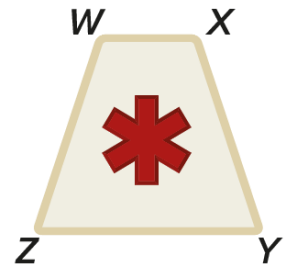
Example 1

1. **SIGNS** The medical sign shown is a trapezoidal prism. The front face of the sign is an isosceles trapezoid. $WX = 2x - 2$, $YZ = 2x + 6$, $WZ = 4x + 5$, $XY = 5x - 3$.

a. Prove $x = 8$.

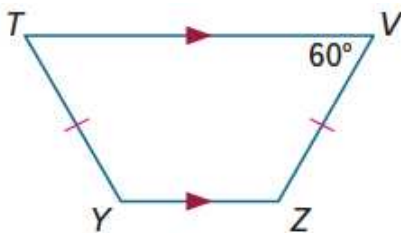
b. Find $m\angle Z$ if $m\angle W = 106^\circ$.

c. Find the perimeter of the front face of the sign in inches.

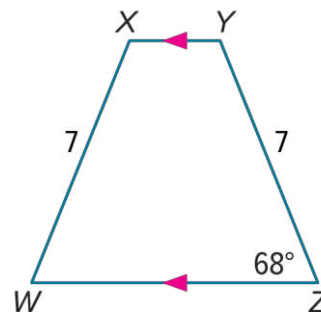


Find each measure.

2. $m\angle T$



3. $m\angle Y$



Example 2

4. $RSTU$ is a quadrilateral with vertices $R(-3, -3)$, $S(5, 1)$, $T(10, -2)$, and $U(-4, -9)$.

- a. Verify that $RSTU$ is a trapezoid.
- b. Is $RSTU$ an isosceles trapezoid? Explain.

5. $ABCD$ is a quadrilateral with vertices $A(-1, 5)$, $B(3, 2)$, $C(-8, 2)$, and $D(-4, 5)$.

- a. Verify that $ABCD$ is a trapezoid.
- b. Is $ABCD$ an isosceles trapezoid? Explain.

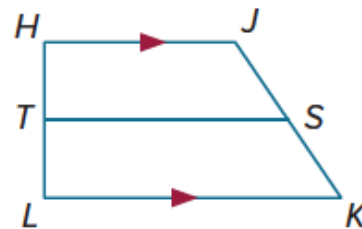
Examples 3 and 4

\overline{TS} is the midsegment of trapezoid $HJKL$.

6. If $HJ = 14$ and $LK = 42$, find TS .

7. If $LK = 19$ and $TS = 15$, find HJ .

8. If $HJ = 7$ and $TS = 10$, find LK .

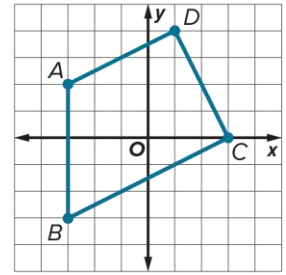


9. If $LK = 17$ and $JH = 9$, find ST .

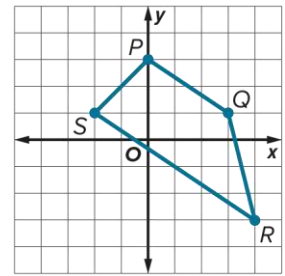
10. If $TS = 24$ and $LK = 27.4$, find HJ .

Example 5

11. In trapezoid $ABCD$, $\overline{AD} \parallel \overline{BC}$. Find the endpoints of the midsegment.



12. In trapezoid $PQRS$, $\overline{PQ} \parallel \overline{SR}$. Find the endpoints of the midsegment.

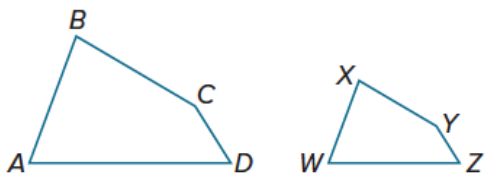


Q11 Determine whether two figures are similar 1 to 10 Pg 127-128

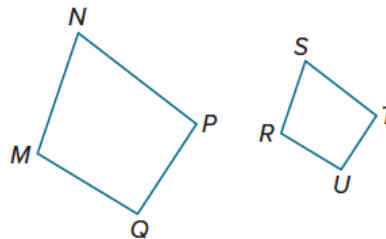
Example 1

List all pairs of congruent angles, and write a proportion that relates the corresponding sides for each pair of similar polygons.

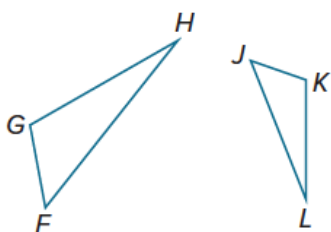
1. $ABCD \sim WXYZ$



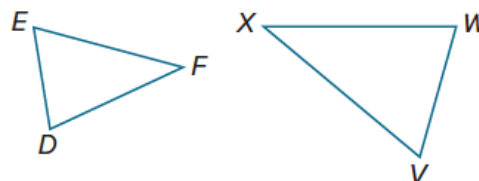
2. $MNPQ \sim RSTU$



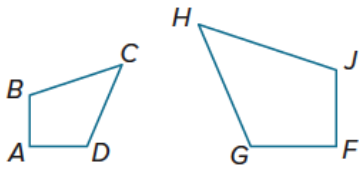
3. $\triangle FGH \sim \triangle JKL$



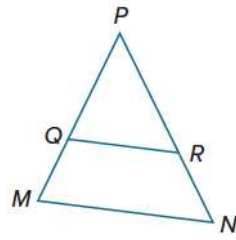
4. $\triangle DEF \sim \triangle VWX$



5. $ABCD \sim FGHI$



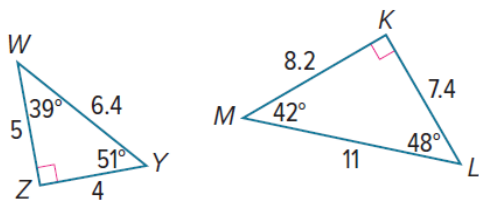
6. $\triangle MNP \sim \triangle QRP$



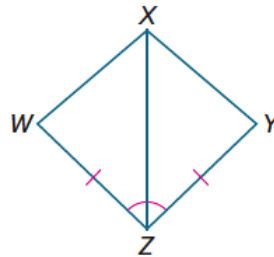
Example 2

Determine whether each pair of figures is similar. If so, find the scale factor. Explain your reasoning.

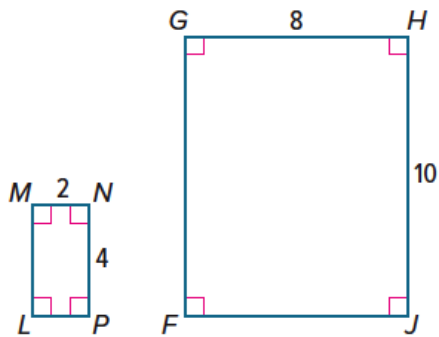
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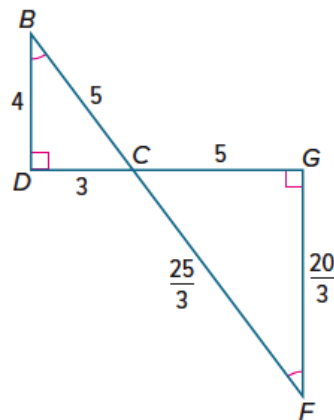
8.



9.



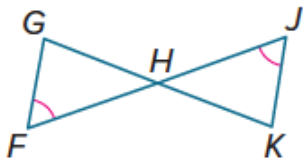
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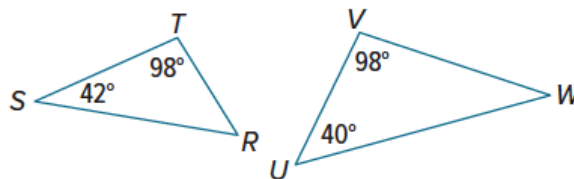
Example 1

Determine whether each pair of triangles is similar. Explain your reasoning.

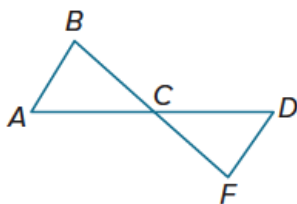
1.



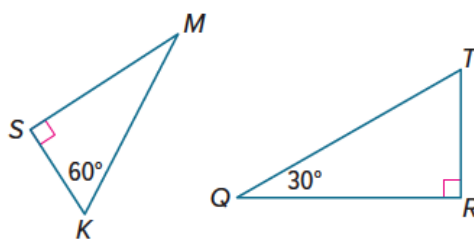
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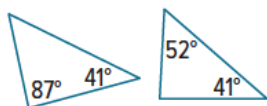
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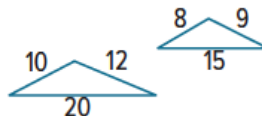
4.



5.

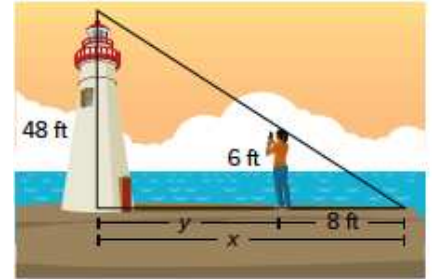


6.

**Example 2**

7. **CELL TOWERS** A cell phone tower casts a shadow that is 100 feet long. At the same time, Lia stands near the tower and casts a shadow that is 3 feet 4 inches long. If Lia is 4 feet 6 inches tall, how tall is the cell phone tower?

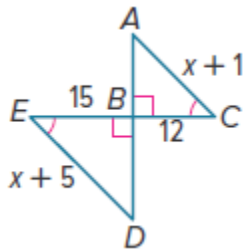
8. **LIGHTHOUSE** Maya wants to know how far she is standing from a lighthouse. The end of Maya's shadow coincides with the end of the lighthouse's shadow.
- What is the distance from the lighthouse to the end of the lighthouse's shadow, x ?
 - What is the distance from Maya to the lighthouse, y ?



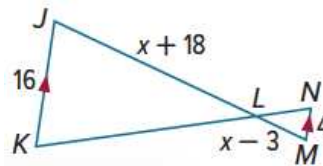
Mixed Exercises

Identify the similar triangles. Then find each measure.

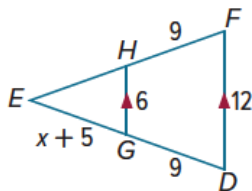
9. AC



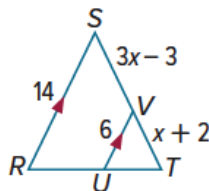
10. JL



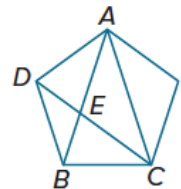
11. EH



12. VT



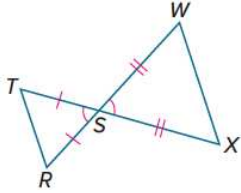
13. Olivia draws a regular pentagon and starts connecting its vertices to make a 5-pointed star. After drawing three of the lines in the star, she becomes curious about two triangles that appear in the figure, $\triangle ABC$ and $\triangle CEB$. They look similar to her. Prove that this is the case.



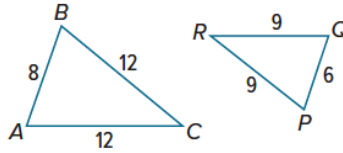
Example 1

Determine whether each pair of triangles is similar. Explain your reasoning.

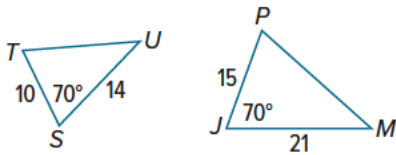
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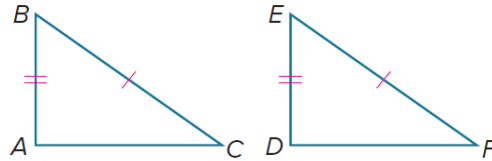
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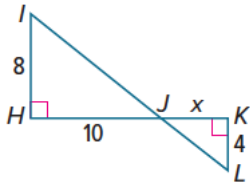
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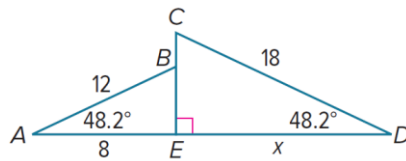
Example 2

Identify the similar triangles. Then find the value of x .

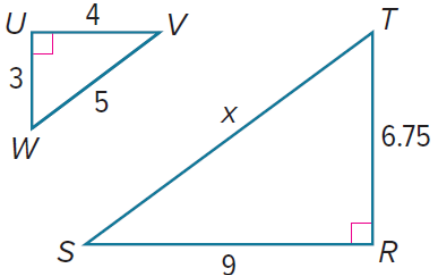
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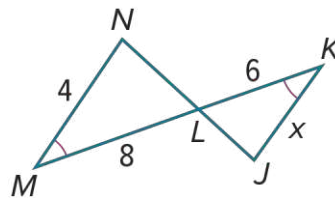
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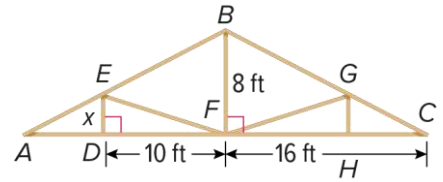


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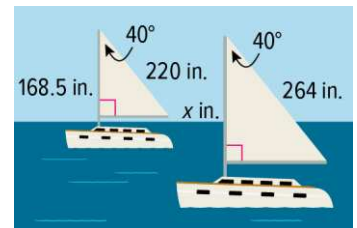
Example 3

9. **ROOFING** The skeleton of a roof is shown. Find the value of x such that triangles DEF and FBC in the outline of the roof are similar.



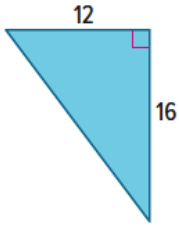
10. **RADIO** A radio tower casts an 8-foot-long shadow at the same time that a vertical yardstick casts a shadow one half inch long. If the triangles formed by the objects and their shadows are similar, how tall is the radio tower?

11. **SAILING** The two sailboats shown are participating in a regatta. If the sails are similar, what is the value of x ?

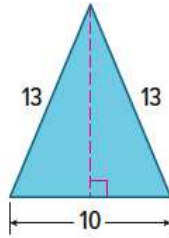


Find the perimeter and area of each figure.

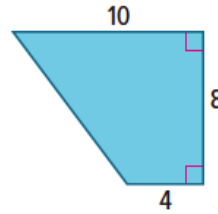
26.



27.



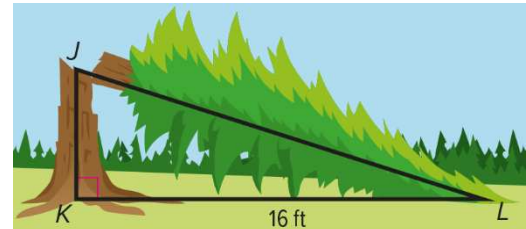
28.



29. The sides of a triangle have measures of x , $x + 5$, and 25. If the measure of the longest side is 25, what value of x makes the triangle a right triangle?

30. **PRECISION** The sides of a triangle have measures of $2x$, 8, and 12. If the measure of the longest side is $2x$, what values of x make the triangle acute?

31. **REASONING** A redwood tree in a national park is 20 meters tall. After it is struck by lightning, the tree breaks and falls over, as shown in the figure. The top of the tree lands at a point 16 feet from the centerline of the tree. A park ranger wants to know the height of the remaining stump of the tree.



a. The ranger lets x represent the height of the stump, \overline{JK} . Explain how the ranger can write an expression for the length of \overline{JL} . Then write an equation that can be used to solve the problem.

b. Show how to solve the equation from part a to find the height of the stump.

32. CONSTRUCT ARGUMENTS Valeria and Sanjia are staking out a garden that has one pair of opposite sides measuring 30 feet and the other pair of sides measuring 40 feet. Using only a 60-foot-long tape measure, how can they be sure that their garden is a rectangle?

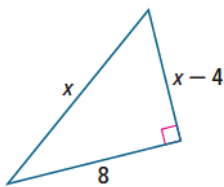
a. Draw a model of the garden with diagonal t . Let $p = 30$ and $q = 40$.

b. If the garden is a rectangle, what must be true about p , q , and t ? Why?

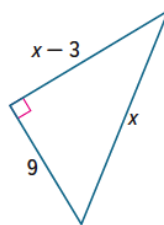
c. Sanjia measures the diagonal and finds that it is 50 feet long. Is there enough information to determine whether their garden is a rectangle? Explain.

Find the value of x .

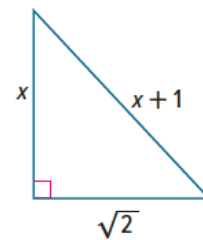
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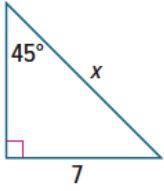
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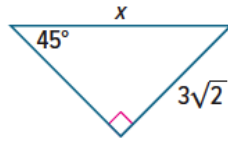
Example 1

REGULARITY Find the value of x .

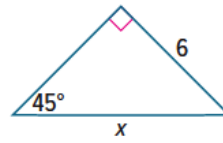
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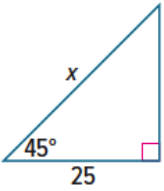
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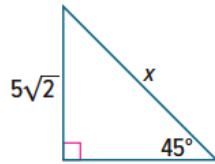
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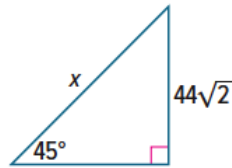
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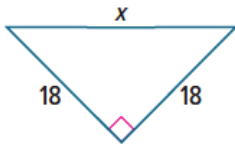
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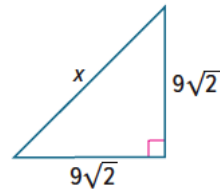
Example 2

Find the value of x .

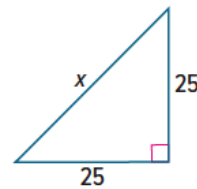
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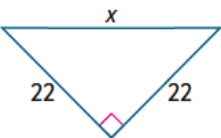
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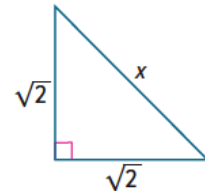
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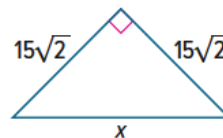
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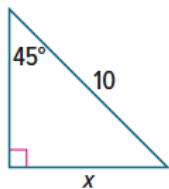
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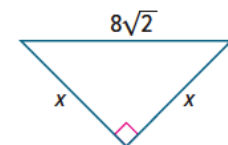
Example 3

Find the value of x .

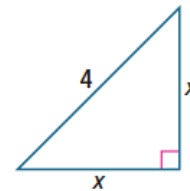
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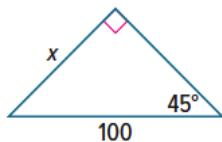
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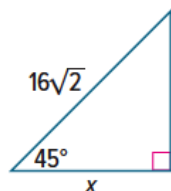
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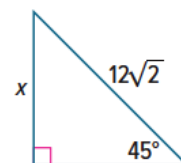
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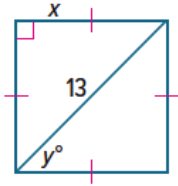


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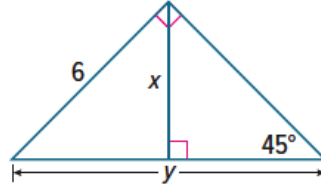


Find the values of x and y .

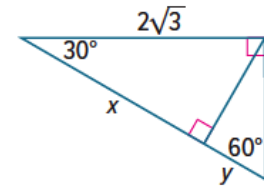
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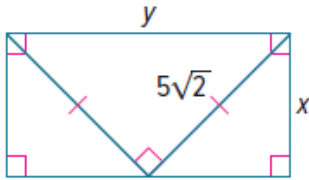
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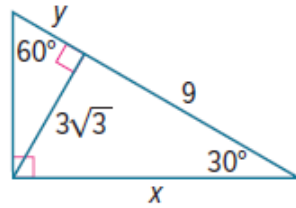
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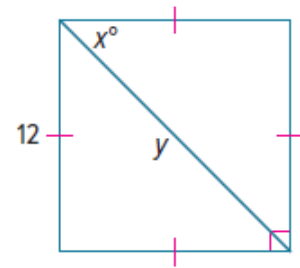
36.



37.



38.



Free Response Questions (Paper-Based)

Q16

Multiply polynomials by monomials

1 to 22

Pg 641,642

Example 1

Simplify each expression.

1. $b(b^2 - 12b + 1)$

2. $f(f^2 + 2f + 25)$

3. $-3m^3(2m^3 - 12m^2 + 2m + 25)$

4. $2j^2(5j^3 - 15j^2 + 2j + 2)$

5. $2pr^2(2pr + 5p^2r - 15p)$

6. $4t^3u(2t^2u^2 - 10tu^4 + 2)$

Example 2

Simplify each expression.

7. $-3(5x^2 + 2x + 9) + x(2x - 3)$

8. $a(-8a^2 + 2a + 4) + 3(6a^2 - 4)$

9. $-4d(5d^2 - 12) + 7(d + 5)$

10. $-9g(-2g + g^2) + 3(g^3 + 4)$

11. $2j(7j^2k^2 + jk^2 + 5k) - 9k(-2j^2k^2 + 2k^2 + 3j)$

12. $4n(2n^3p^2 - 3np^2 + 5n) + 4p(6n^2p - 2np^2 + 3p)$

Example 3

13. NUMBER THEORY The sum of the first n whole numbers is given by the expression $\frac{1}{2}(n^2 + n)$.

Expand the equation by multiplying, then find the sum of the first 12 whole numbers.

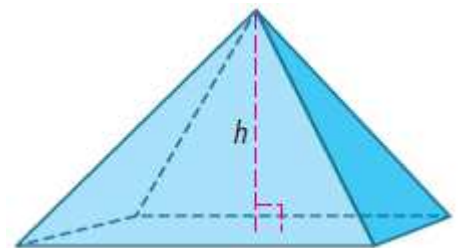
14. COLLEGE Troy's grandfather gave him \$700 to start his college savings account. Troy's grandfather also gives him \$40 each month to add to the account. Troy's mother gives him \$50 each month, but has been doing so for 4 fewer months than Troy's grandfather. Write a simplified expression for the amount of money Troy has received m months after his mother started giving him money.

15. MARKET Sophia went to the farmers' market to purchase some vegetables. She bought peppers and potatoes. The peppers were \$0.39 each and the potatoes were \$0.29 each. She spent \$3.88 on vegetables, and bought 4 more potatoes than peppers. If x = the number of peppers, write and solve an equation to find out how many of each vegetable Sophia bought.

16. GEOMETRY The volume of a pyramid can be found by multiplying the area of its base B by one-third of its height. The area of the rectangular base of a pyramid is given by the polynomial equation $B = x^2 - 4x - 12$.

a. Write a polynomial equation to represent the volume of the pyramid V if its height is 10 meters.

b. Find the volume of the pyramid if $x = 12$ m.



Example 4**Solve each equation.**

17. $7(t^2 + 5t - 9) + t = t(7t - 2) + 13$

18. $w(4w + 6) + 2w = 2(2w^2 + 7w - 3)$

19. $5(4z + 6) - 2(z - 4) = 7z(z + 4) - z(7z - 2) - 48$

20. $9c(c - 11) + 10(5c - 3) = 3c(c + 5) + c(6c - 3) - 30$

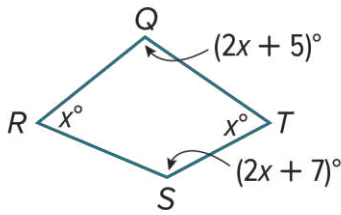
21. $2f(5f - 2) - 10(f^2 - 3f + 6) = -8f(f + 4) + 4(2f^2 - 7f)$

22. $2k(-3k + 4) + 6(k^2 + 10) = k(4k + 8) - 2k(2k + 5)$

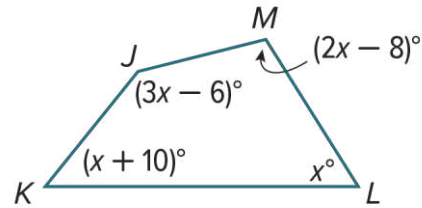
Example 1

Find the measure of each interior angle.

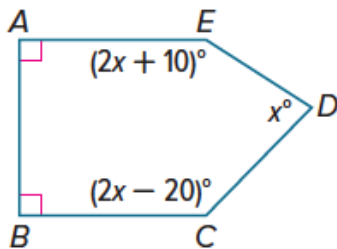
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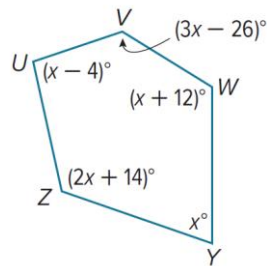
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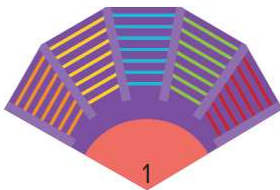
4.

**Example 2**

5. **ARCHITECTURE** In the Uffizi gallery in Florence, Italy, there is a room built by Buontalenti called the Tribune (*La Tribuna* in Italian). This room is shaped like a regular octagon. What is the measure of the angle formed by two consecutive walls of the Tribune.



6. **THEATER** A theater floor plan is shown. The upper five sides are part of a regular dodecagon. Find $m\angle 1$.



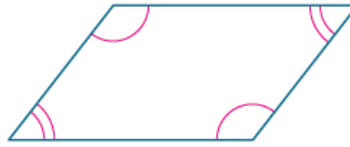
Example 1

Determine whether each quadrilateral is a parallelogram. Justify your answer.

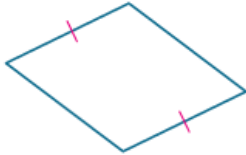
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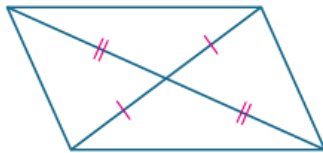
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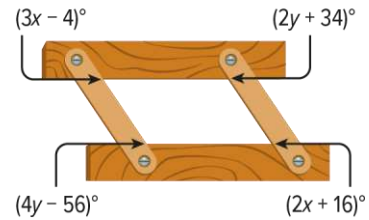


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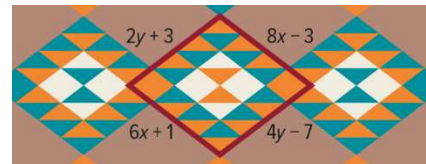


Example 2

7. **ORGANIZATION** The space between the hinges and trays of a collapsible tray organizer appears to be a parallelogram. Find the values of x and y so that the trays and hinges of the organizer form a parallelogram.

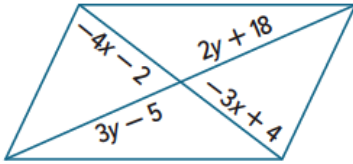


8. **PATTERNS** Many Native American rugs and blankets incorporate parallelograms into the designs. Find the values of x and y so that the quadrilateral shown is a parallelogram.

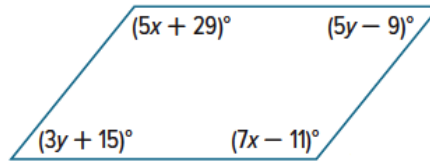


Find the values of x and y so that each quadrilateral is a parallelogram.

9.

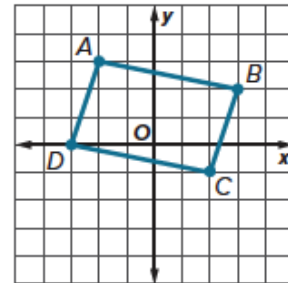


10.



Example 3

11. Determine whether $ABCD$ is a parallelogram. Justify your answer.



CONSTRUCT ARGUMENTS For exercises 12-15, graph each quadrilateral with the given vertices. Determine whether the figure is a parallelogram. Justify your answer with the method indicated.

12. $P(0, 0)$, $Q(3, 4)$, $S(7, 4)$, $Y(4, 0)$; Slope Formula

13. $S(-2, 1)$, $R(1, 3)$, $T(2, 0)$, $Z(-1, -2)$; Distance and Slope Formulas

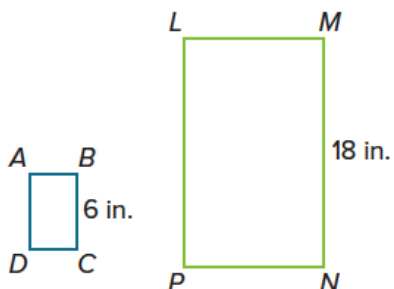
14. $W(2, 5)$, $R(3, 3)$, $Y(-2, -3)$, $N(-3, 1)$; Midpoint Formula

15. $W(1, -4)$, $X(-4, 2)$, $Y(1, -1)$, and $Z(-2, -3)$; Slope Formula

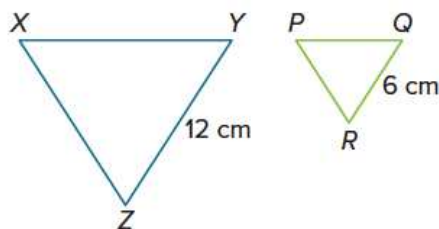
Example 1

Determine whether the dilation from the figure on the left to the figure on the right is an *enlargement* or a *reduction*. Then find the scale factor of the dilation.

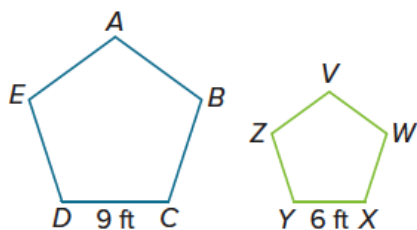
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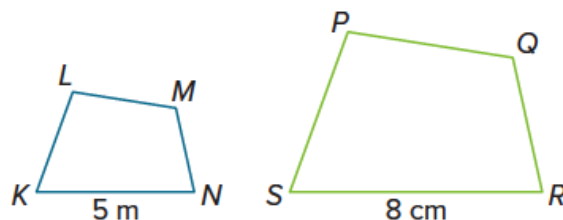
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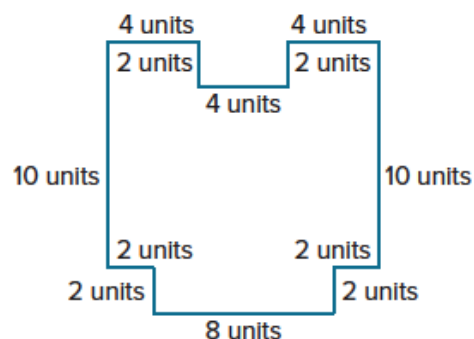


4.



Example 2

5. **BLUEPRINTS** Ezra is redrawing the blueprint shown of a stage he is planning to build for his band. By what percentage should he multiply the dimensions of the stage so that the dimensions of the image are $\frac{1}{2}$ the size of the original blueprint? What will be the perimeter of the updated blueprint?



Example 3

For each set of triangle vertices, find and graph the coordinates of the vertices of the image after a dilation of the triangle by the given scale factor.

6. $J(-8, 0), K(-4, 4), L(-2, 0), k = 0.5$ 7. $S(0, 0), T(-4, 0), V(-8, -8), k = 1.25$

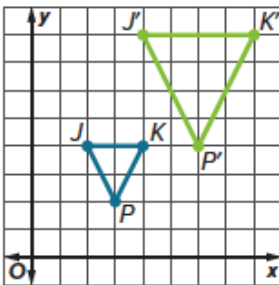
8. $A(9, 9), B(3, 3), C(6, 0), k = \frac{1}{3}$

9. $D(4, 4), F(0, 0), G(8, 0), k = 0.75$

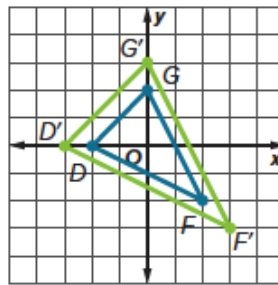
Example 4

Find the scale factor of the dilation.

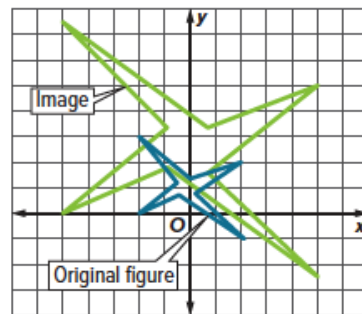
10. $\triangle J'K'P'$ is the image of $\triangle JKP$.



11. $\triangle D'F'G'$ is the image of $\triangle DFG$.



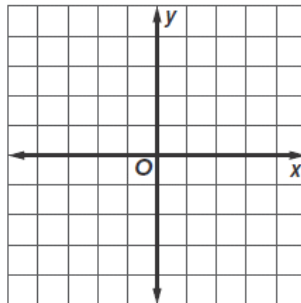
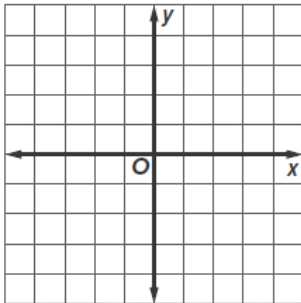
12. Tyrone drew a logo and a dilation of the same logo on the coordinate plane. What is the scale factor of the dilation?



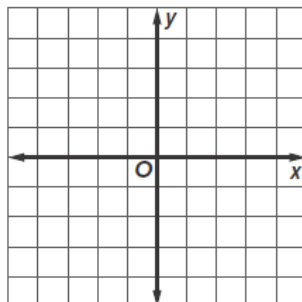
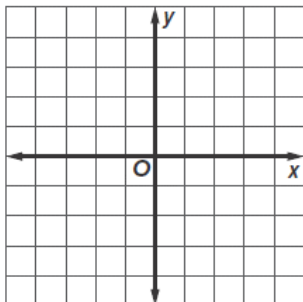
Mixed Exercises

Graph the image of each polygon with the given vertices after a dilation centered at the origin with the given scale factor.

13. $F(-10, 4), G(-4, 4), H(-4, -8), k = 0.2$ 14. $X(2, -1), Y(-6, 4), Z(-2, -5), k = \frac{5}{4}$

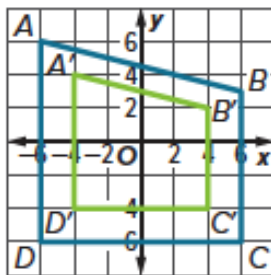


15. $M(4, 6), N(-6, 2), P(0, -8), k = \frac{3}{4}$ 16. $R(-2, 6), S(0, -1), T(-5, 3), k = 1.5$

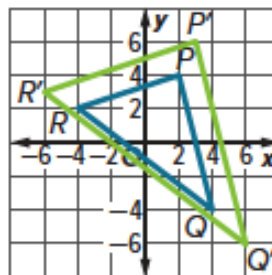


Find the scale factor of the dilation.

17. $A'B'C'D'$ is the image of $ABCD$.



18. $\triangle P'Q'R'$ is the image of $\triangle PQR$.



Example 4

Determine whether the points X , Y , and Z can be the vertices of a triangle. If so, classify the triangle as *acute*, *right*, or *obtuse*. Justify your answer.

15. $X(-3, -2)$, $Y(-1, 0)$, $Z(0, -1)$

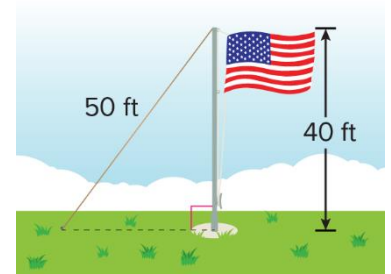
16. $X(-7, -3)$, $Y(-2, -5)$, $Z(-4, -1)$

17. $X(1, 2)$, $Y(4, 6)$, $Z(6, 6)$

18. $X(3, 1)$, $Y(3, 7)$, $Z(11, 1)$

Mixed Exercises

19. **TETHERS** To help support a flag pole, a 50-foot-long tether is tied to the pole at a point 40 feet above the ground. The tether is pulled taut and tied to an anchor in the ground. How far away from the base of the pole is the anchor?



Determine whether each set of measures can be the measures of the sides of a triangle. If so, classify the triangle as *acute*, *obtuse*, or *right*. Justify your answer.

20. $\sqrt{5}$, $\sqrt{12}$, $\sqrt{13}$

21. 2, $\sqrt{8}$, $\sqrt{12}$

22. 9, 40, 41