كل ما يحتاجه الطالب في جميع الصفوف من أوراق عمل واختبارات ومذكرات، يجده هنا في الروابط التالية لأفضل مواقع تعليمي إماراتي 100 %

تطبيق المناهج الإماراتية	الاجتماعيات	الرياضيات	
الصفحة الرسمية على التلغرام	الاسلامية	العلوم	
الصفحة الرسمية على الفيسبوك	الانجليزية		
التربية الاخلاقية لجميع الصفوف	اللغة العربية		
التربية الرياضية			

مجموعات التلغرام.	مجموعات الفيسبوك	قنوات تلغرام	قنوات الفيسبوك
الصف الأول	الصف الأول	الصف الأول	الصف الأول
الصف الثاني	الصف الثاني	الصف الثاني	الصف الثاني
الصف الثالث	الصف الثالث	الصف الثالث	الصف الثالث
الصف الرابع	الصف الرابع	الصف الرابع	الصف الرابع
الصف الخامس	الصف الخامس	الصف الخامس	الصف الخامس
الصف السادس	الصف السادس	الصف السادس	الصف السادس
الصف السابع	الصف السابع	الصف السابع	الصف السابع
الصف الثامن	الصف الثامن	الصف الثامن	الصف الثامن
الصف التاسع عام	الصف التاسع عام	الصف التاسع عام	الصف التاسع عام
الصف التاسع متقدم	الصف التاسع متقدم	الصف التاسع متقدم	تاسع متقدم
الصف العاشر عام	الصف العاشر عام	الصف العاشر عام	عاشر عام
الصف العاشر متقدم	الصف العاشر متقدم	الصف العاشر متقدم	عاشر متقدم
الحادي عشر عام	الحادي عشر عام	الحادي عشر عام	حادي عشر عام
الحادي عشر متقدم	الحادي عشر متقدم	الحادي عشر متقدم	حادي عشر متقدم
ثانى عشر عام	الثانى عشر عام	الثانى عشر عام	الثانى عشر عام
ثانى عشر متقدم	الثانى عشر متقدم	ثانى عشر متقدم	ثانى عشر متقدم

GRADE 9 Advanced Mathematics

Revision Sheet for Term 2 – 2018/2019

Chapter 7 – Revision Sheet (All the steps must be neatly shown)

Key Concepts:

Operations with Polynomials (Lessons 7-1 through 7-4)

- To add or subtract polynomials, add or subtract like terms.
- To multiply polynomials, use the Distributive Property.
- Special products: $(a + b)^2 = a^2 + 2ab + b^2$
$(a - b)^2 = a^2 - 2ab + b^2$
$(a + b)(a - b) = a^2 - b^2$

Factoring Using the Distributive Property (Lesson 7-5)

- Using the Distributive Property to factor polynomials with four or more terms is called factoring by grouping.
$ax + bx + ay + by = x(a + b) + y(a + b)$
$= (a + b)(x + y)$

Solving Quadratic Equations by Factoring
(Lessons 7-6 through 7-8)

- To factor $x^2 + bx + c$, find m and p with a sum of b and a product of c. Then write $x^2 + bx + c$ as $(x + m)(x + p)$.

- To factor $ax^2 + bx + c$, find m and p with a sum of b and a product of ac. Then write as $ax^2 + mx + px + c$ and factor by grouping.

- $a^2 - b^2 = (a - b)(a + b)$

Perfect Squares and Factoring (Lesson 7-9)

- For a trinomial to be a perfect square, the first and last terms must be perfect squares, and the middle term must be twice the product of the square roots of the first and last terms.

- For any number $n \geq 0$, if $x^2 = n$, then $x = \pm\sqrt{n}$.

1. Write the polynomial $3x^5 - 2 + 6x - 2x^2 + x^3$ in standard form. Also identify the leading coefficient.

2. Simplify $a^2 + 5a - 3 - (2a^2 - 4a + 3)$

3. Solve $m(2m - 5) + m = 2m(m - 6) + 16$.
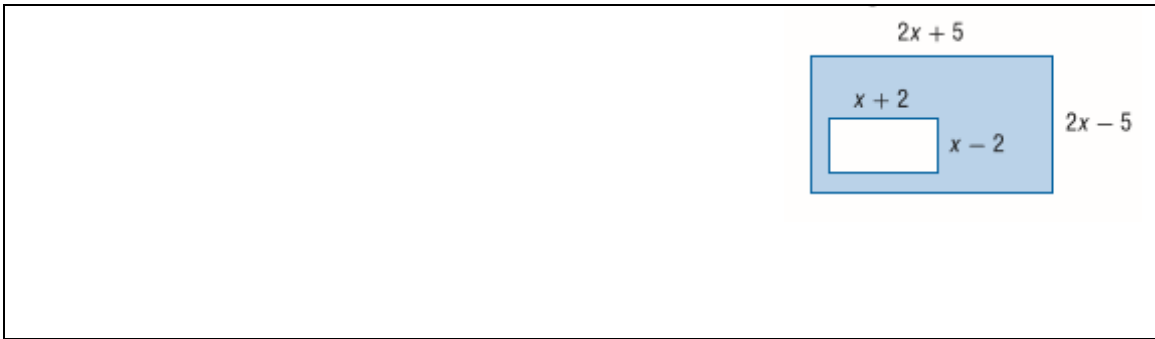
4. Find the area and perimeter of the rectangle?

3x

$x^2 + x - 7$

5. Find each product.

(a) $(6a + 5)(3a - 2)$	(b) $(5x + 4)^2$

(c) $(x-7)^2$	(d) $(3m-2)(3m+2)$

6. Write an expression to represent the area of the shaded region.

7. Use the Distributive Property to factor each polynomial

(a) $8xy - 16x^3y + 10y$	(b) $24am - 9an + 40bm - 15bn$

8. Solve each equation by factoring. Check your solutions.

(a) $3x^2 = 5x$	(b) $x^2 + 12x + 32 = 0$
(c) $x^2 + 5x - 50 = 0$	(d) $x^2 - 6x + 8 = 0$
(e) $x^2 - 2x - 48 = 0$	(f) $40x^2 + 2x = 24$

(g) $6x^2 - 7x - 5 = 0$	(h) $9x^2 - 25 = 0$
(i) $x^2 - 6 = 30$	(j) $(x - 5)^2 = 121$

8. Which of the following polynomials is prime?
    (a) $x^2 + 12x + 36$ (b) $x^2 + 5x + 25$ (c) $9y^2 - 12y + 4$ (d) $x^4 - 16x^2$

9. A boulder falls down a mountain into water 64 feet below. The distance d that the boulder falls in t seconds is given by the equation $d = 16t^2$. How long does it take the boulder to hit the water?

10. A sidewalk of equal width "x" is being built around a square yard. What is the width of the sidewalk?

Total area, 900 ft²

6 ft

Multiplication and Division Properties of Exponents (Lessons 8-1 and 8-2)

For any nonzero real numbers a and b and any integers m, n, and p, the following are true.

- Product of Powers: $a^m \cdot a^n = a^{m+n}$

- Power of a Power: $(a^m)^n = a^{m \cdot n}$

- Power of a Product: $(ab)^m = a^m b^m$

- Quotient of Powers: $\dfrac{a^m}{a^p} = a^{m-p}$

- Power of a Quotient: $\left(\dfrac{a}{b}\right)^m = \dfrac{a^m}{b^m}$

- Zero Exponent: $a^0 = 1$

- Negative Exponent: $a^{-n} = \dfrac{1}{a^n}$ and $\dfrac{1}{a^{-n}} = a^n$

Rational Exponents (Lesson 8-3)

For any positive real number b and any integers m and $n > 1$, the following are true.

$$b^{\frac{1}{2}} = \sqrt{b} \qquad b^{\frac{1}{n}} = \sqrt[n]{b} \qquad b^{\frac{m}{n}} = \left(\sqrt[n]{b}\right)^m \text{ or } \sqrt[n]{b^m}$$

Scientific Notation (Lesson 8-4)

- A number is in scientific notation if it is in the form $a \times 10^n$, where $1 \le a < 10$.

- To write in standard form:
  - If $n > 0$, move the decimal n places right.
  - If $n < 0$, move the decimal n places left.

Exponential Functions (Lessons 8-5 and 8-6)

- The equation for exponential growth is $y = a(1 + r)^t$, where $r > 0$. The equation for exponential decay is $y = a(1 - r)^t$, where $0 < r < 1$. y is the final amount, a is the initial amount, r is the rate of change, and t is the time in years.

1. Simplify the following: *(Chapter 8.1 and 8.2)*

a) $(5x^2y^3)(2x^4y)$

b) $(3a^2b^4)^3$

c) $\left(\frac{6xy^{11}z^9}{48x^6yz^{-1}}\right)^0$ (Assume that no denominator equals zero.)

d) $\frac{2k^4m^3}{4k^2m}$ (Assume that no denominator equals zero.)

e) $\frac{t^4uv^{-2}}{t^{-3}u^7}$ (Assume that no denominator equals zero.)

2. Solve the following equations: *(Chapter 8.3)*

a) $2^x = 64$

b) $4^{4x-1} = 32$

c) $9^{x-1} = 729$

3. Express each number in standard form: *(Chapter 8.4)*

a) 4.5×10^4

b) 7.104×10^{-3}

4. Express each number in scientific notation: *(Chapter 8.4)*
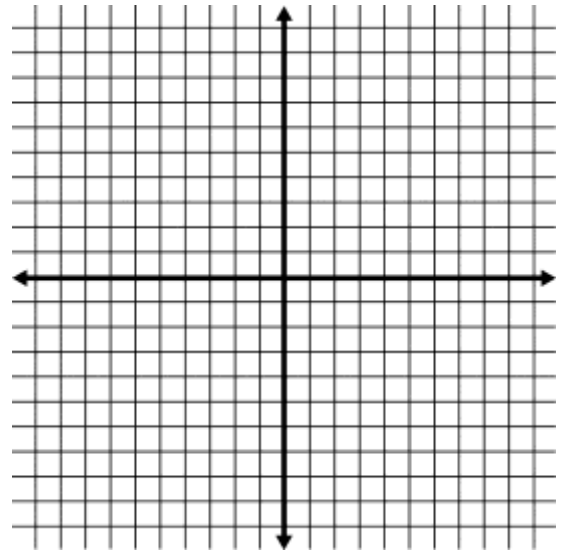
    a) $2,300,000$

    b) 0.0000053

5. Graph each function. Find the $y\text{-}intercept$ and state the domain and range. *(Chapter 8.5)*

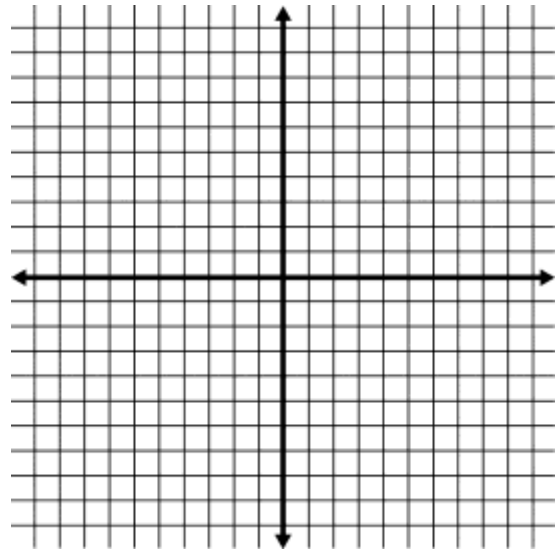   **a)** $y = 2^x$
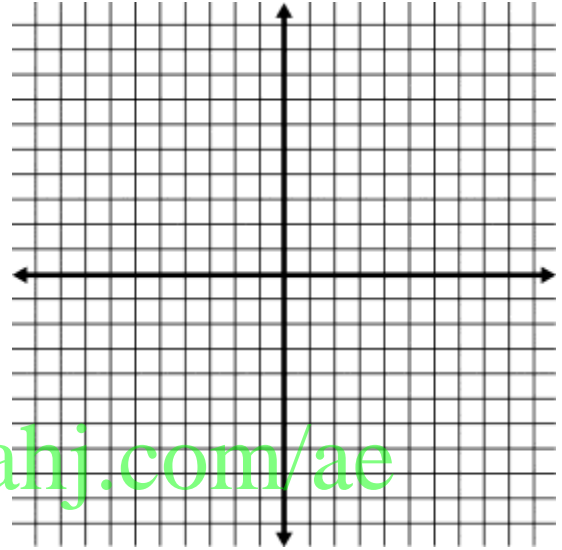
    b) $y = 4^x + 2$

c) $y = \left(\frac{1}{3}\right)^x$

6. Find the value of AED 2,500 invested at an interest rate of 2% compounded monthly for 10 years. *(Chapter 8.6)*

7. Alia's computer is depreciating at a rate of 3% per year. She bought the computer for AED 1,200. *(Chapter 8.6)*

8. Find the next three terms and then find the $nth\ term$ of each geometric sequence *(Chapter 8.7)*

   a) $-1, 1, -1, 1, \dots$

   b) $3, 9, 27, \dots$

   c) $256, 128, 64, \dots$

9. A basketball is dropped from height of $20\ meters$. It bounces $half$ the height after each bounce. Find the $nth\ term$ of this geometric sequence. *(Chapter 8.7)*

10. Find the first five terms of each sequence. *(Chapter 8.8)*

a) $a_1 = 11, \ a_n = a_{n-1} - 4, \ n \geq 2$

b) $a_1 = 3, \ a_n = 2a_{n-1} + 6, \ n \geq 2$

11. Write a recursive formula for each sequence. *(Chapter 8.8)*
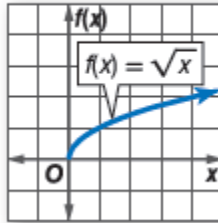
a) $2, 7, 12, 17, \ldots$

b) $32, 16, 8, 4, \ldots$

Chapter 9: Radical Functions, Rational Functions and Equations

KEY CONCEPTS:

Square Root Functions (Lesson 9-1)

- A square root function contains the square root of a variable.

- The parent function of the family of square root functions is $f(x) = \sqrt{x}$.

$f(x)$
$f(x) = \sqrt{x}$
O
x

Simplifying Radical Expressions (Lesson 9-2)

- A radical expression is in simplest form when

  - no radicands have perfect square factors other than 1,

  - no radicals contain fractions,

  - and no radicals appear in the denominator of a fraction.

Operations with Radical Expressions and Equations (Lessons 9-3 and 9-4)

- Radical expressions with like radicals can be added or subtracted.

- Use the FOIL method to multiply radical expressions.

Inverse Variation (Lesson 9-5)

- You can use $\dfrac{x_1}{x_2} = \dfrac{y_2}{y_1}$ to solve problems involving inverse variation.

Rational Functions (Lesson 9-6)

- Excluded values are values of a variable that result in a denominator of zero.

- If vertical asymptotes occur, it will be at excluded values.
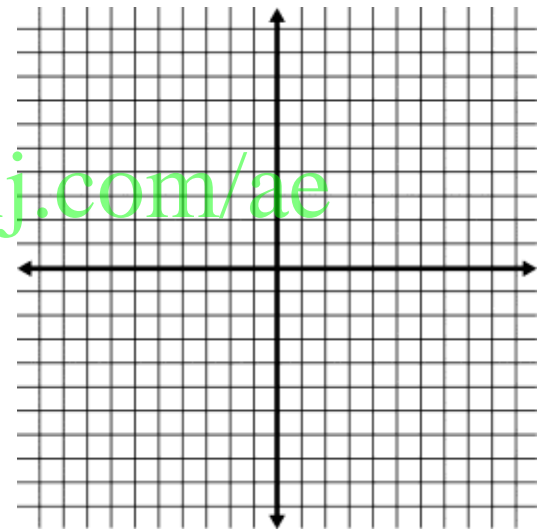
Solving Rational Equations (Lesson 9-7)

- Use cross products to solve rational equations with a single fraction on each side of the equals sign.

1. Graph each function. Compare to the parent graph. State the domain and range.
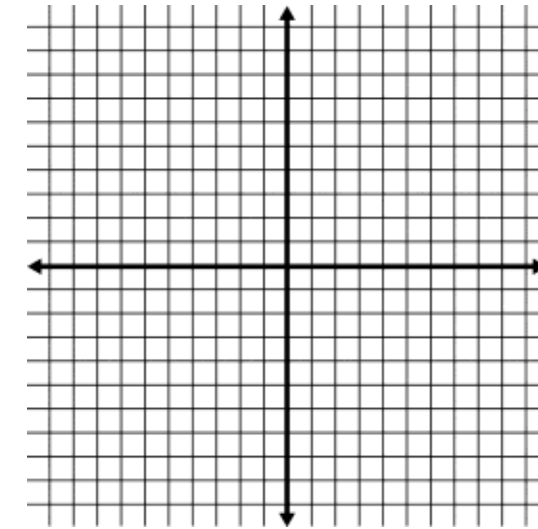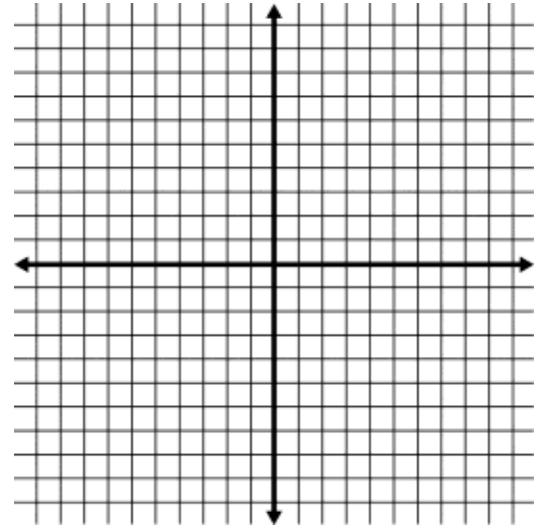
a. $y = \sqrt{x} + 2$
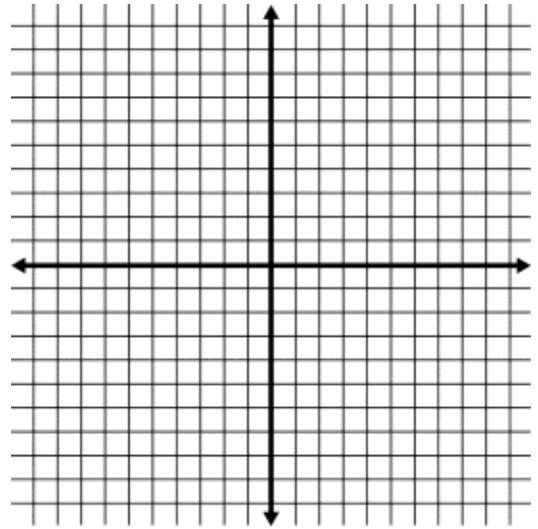
b. $y = -4\sqrt{x}$

c. $y = \sqrt{x + 3}$

2. **The perimeter of a square is given by the function P = $4\sqrt{A}$, where A is the area of the square.**

   a. Graph the function.

   b. Determine the perimeter of the square with an area of 225m^2.

   c. When will the perimeter and the area be the same value?

3. **Simplify**

a. $\sqrt{20ab^3}$

b. $(1 + \sqrt{2})^2$

c. $\dfrac{5}{\sqrt{7}+6}$

4. The speed of sound in air is determined by the temperature of the air. The speed c in meters per cesond is given by c = 331.5 $\sqrt{1 + \dfrac{t}{273.15}}$, where t is the temperature of the air in degrees Celsius. How fast does sound travel when the temperature is 55° C?

5. Simplify
a. $2\sqrt{6}$ - $\sqrt{48}$

b. $(3\sqrt{11} + 3\sqrt{15})(3\sqrt{3} - 2\sqrt{2})$

6. Solve each equation. Check your solution.
a. $\sqrt{a}$ + 11 = 21

b. $\sqrt{c + 10}$ = 4

c. $\sqrt{r + 3}$ = r − 3

7. Solve. Assume that y varies inversely as x.

a. If y = - 8 when x = - 12, find y when x = 10.

b. If y = 9.2 when x = 6, find x when y = 3.

8. State the excluded value for each function.

a. $y = \dfrac{8}{x-8}$

b. $y = \dfrac{x}{x+2}$

9. Solve each equation. State any extraneous solutions.

a. $\dfrac{a+3}{a} - \dfrac{6}{5a} = \dfrac{1}{a}$

b. $\dfrac{n^2-n-6}{n^2-n} - \dfrac{n-5}{n-1} = \dfrac{n-3}{n^2-n}$

Points, Lines, and Planes (Lesson 10-1)

- There is exactly one line through any two points.
- There is exactly one plane through any three noncollinear points.

Distance and Midpoints (Lesson 10-3)

- On a number line, the measure of a segment with endpoint coordinates a and b is $|a - b|$.
- In the coordinate plane, the distance between two points (x_1, y_1) and (x_2, y_2) is given by $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$.
- On a number line, the coordinate of the midpoint of a segment with endpoints a and b is $\dfrac{a + b}{2}$.
- In the coordinate plane, the coordinates of the midpoint of a segment with endpoints that are (x_1, y_1) and (x_2, y_2) are $\left(\dfrac{x_1 + x_2}{2}, \dfrac{y_1 + y_2}{2}\right)$.

Angles (Lessons 10-3, 10-4, and 10-5)

- An angle is formed by two noncollinear rays that have a common endpoint, called its vertex. Angles can be classified by their measures.
- Adjacent angles are two coplanar angles that lie in the same plane and have a common vertex and a common side but no common interior points.
- Vertical angles are two nonadjacent angles formed by two intersecting lines.
- A linear pair is a pair of adjacent angles with noncommon sides that are opposite rays.
- Complementary angles are two angles with measures that have a sum of 90.
- Supplementary angles are two angles with measures that have a sum of 180.

Proof (Lessons 10-7 and 10-8)

Step 1 List the given information and draw a diagram, if possible.

Step 2 State what is to be proved.

Step 3 Create a deductive argument.

Step 4 Justify each statement with a reason.

Step 5 State what you have proved.

1. Use the figure to complete each of the following.

   (a) Name the lines that are only in plane Q.

   _____

   (b) How many planes are labeled in the figure?

   _____

   (c) Name the plane containing the lines m and t.

   _____

   (d) Name the intersection of lines m and t.

   _____

   (e) Name a point that is not coplanar with points A, B, and C. _____

   (f) Are points F, M, G, and P coplanar? Explain.

   _____

   _____
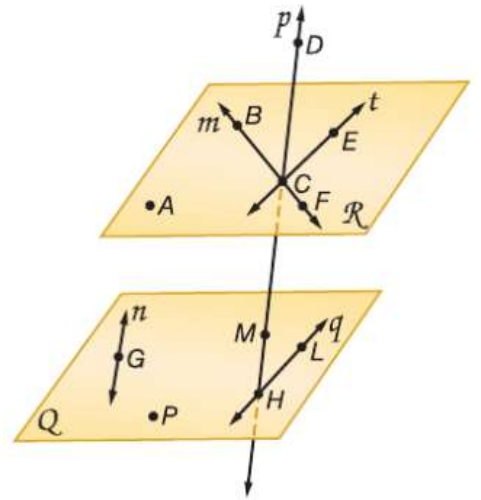
   _____

   (g) Name the points not contained in a line shown. _____

   (h) What is another name for line t? _____

   (i) Does line n intersect line q? Explain.

   _____

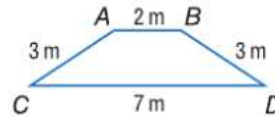   _____

2. Find the value of the variable and YZ if Y is between X and Z.
   (a) XY = 7a, YZ = 5a, XZ = 6a + 24

   (b) XY = 6b, YZ = 8b, XZ = 175
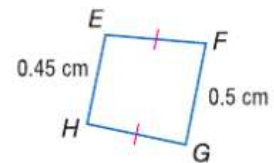
(c) XY = 4n + 3, YZ = 2n - 7, XZ = 22

3. Determine whether each pair of segments is congruent.
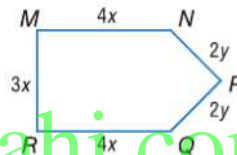   (a) $\overline{AC}, \overline{BD}$

   A 2 m B
   3 m   3 m
   C   7 m   D

   (b) $\overline{EH}, \overline{FG}$

   E
   0.45 cm   F
              0.5 cm
   H
              G

   (c) $\overline{MN}, \overline{RQ}$

   M   4x   N
              2y
   3x   P
              2y
   R   4x   Q

4. Find the distance between each pair of points.
   (a) ML

   M(4, 0)
   O   x
   L(−2, −3)

   (b) EF

   8 y
   E(−7, 5)
        4
   −8 −4 O 4 8 x
        −4 F(3, −5)
        −8
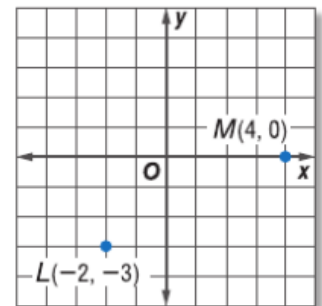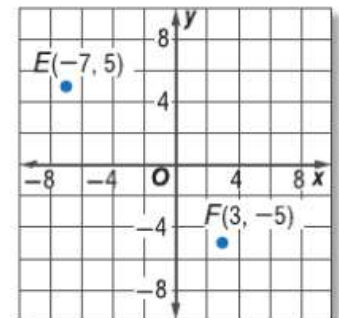
5. Find the coordinates of the midpoint of a segment with the given endpoints.
    (a) W(12, 2), X(7, 9)

    (b) V(-2, 5), Z(3, -17)

    (c) X(-2.4, -14), Y(-6, -6.8)

6. Moza and Maha are hiking in a state park and decide to take separate trails. The map of the park
    is set up on a coordinate grid. Moza's location is at the point (7, 13) and Maha is at (3, 5).
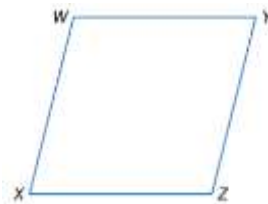   (a) Find the distance between them.

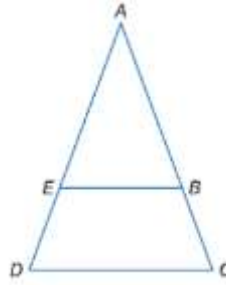   (b) Find the coordinates of the point midway between their locations.

7. Write a two-column proof.
    (a) Given: $\overline{XW} \cong \overline{YZ}$ and $\overline{YZ} \cong \overline{ZX}$.
        Prove: $\overline{XW} \cong \overline{ZX}$

20

(b) Given: $\overline{AC} \cong \overline{AD}$ and $\overline{ED} \cong \overline{BC}$.
   Prove: $\overline{AE} \cong \overline{AB}$.

(c) ABCD is a rectangle. Prove that $\overline{AC} \cong \overline{BD}$

KEY CONCEPTS: Chapter 11

Inductive Reasoning and Logic (Lessons 11-1 and 11-2)

- Inductive reasoning: a conjecture is reached based on observations of a previous pattern

- Counterexample: an example that proves a conjecture is false

- Negation of statement p: $\sim p$

- Conjunction: a compound statement formed with the word *and*

- Disjunction: a compound statement formed with the word *or*

Conditional Statements (Lesson 11-3)

- An if-then statement is written in the form if p, then q in which p is the hypothesis and q is the conclusion.

statement	$p \rightarrow q$
converse	$q \rightarrow p$
inverse	$\sim p \rightarrow \sim q$
contrapositive	$\sim q \rightarrow \sim p$

Deductive Reasoning (Lesson 11-4)

- Law of Detachment: If $p \rightarrow q$ is true and p is true, then q is also true.

- Law of Syllogism: If $p \rightarrow q$ and $q \rightarrow r$ are true, then $p \rightarrow r$ is also true.

1. Make a conjecture about the sum of the squares of two consecutive natural numbers.
   List or draw some examples that support your conjecture.

2. Write a conjecture that describes the pattern in each sequence. Then use your conjecture
   to find the next item in the sequence.

3. Determine whether each conjecture is true or false. Give a counterexample for any false
   conjecture.
   a. If n is a prime number, then n + 1 is not prime.
   b. If you have three points A, B, and C, then A, B, C are noncollinear.
   c. If in $\triangle ABC$, $(AB)^2 + (BC)^2 = (AC)^2$, then $\triangle ABC$ is a right triangle.

4. Write a compound statement using conjunction and disjunction.

   p: A week has seven days.

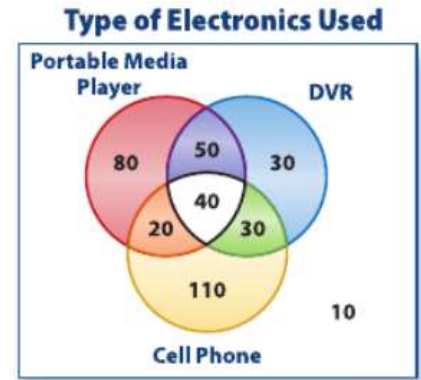   q: There are 20 hours in a day.

   r: There are 60 minutes in an hour.

   a. $p \land r$
   b. $\sim p \land r$
   c. $\sim q \lor \sim r$

5. Construct a truth table to ~p ∧ r.

   a. A group of 330 teens were surveyed about what type of electronics they used. They chose from a cell phone, a portable media player, and a DVR. The results are shown in the Venn diagram.

   b. How many teens used only a portable media player and DVR?

   c. How many said they used all three types of electronics?

   d. How many said they used only a cell phone?

   e. How many teens said they used only a portable media player and a cell phone?

   f. Describe the electronics that the 10 teens outside of the regions use.

6. Write the statement in if-then form.

   Eight-teen-year olds are eligble to drive.

7. True or false? If false, write a counterexample.

   If tomorrow is Friday. then today is Thursday.

   If an animal is spotted then it is a Dalmatian.

8. Write converse, inverse and contrapositive of the following statement. Determine the truth value of each statement.

   If you live in Dubai, you live in Abu Dhabi.

   a. Determine whether each conclusion is valid based on the given information. If not, write invalid. Explain your reasoning.

   Given: If three points are noncollinear, they determine a plane. Points A, B, and C lie in plane G.

Conclusion: Points A, B, and C are noncollinear

b. Given: If a student turns in a permission slip, then the student can go on the field trip. Khalid turned in his permission slip.

Conclusion:Khalid can go on the field trip.

9. Determine whether the stated conclusion is valid based ont he given information. If not, write *invalid*. Explain your reasoning.

Given: If a number is divisible by 4, then the number is divisible by 2. 12 is divisible by 4.

Conclusion: 12 is divisible by 2.

Given: If bilal stays up late, he will be tired the next day. Bilal is tired.

Conclusion: Bilal stayed up late.