

# Red Bank Regional Geometry Summer Work

The contents in this packet must be **completed on a separate sheet of paper an orderly fashion** by the **first day** of geometry class in September 2009. This packet will count as a grade for the first marking period along with **a pre-test given during the second meeting** of your geometry class. The pretest will contain material covered throughout the 93 questions of the packet. All material is considered to be prior knowledge; students will be held accountable for all content throughout the school year.

If you need a reference, you can access the online version of the geometry textbook at **www.classzone.com**

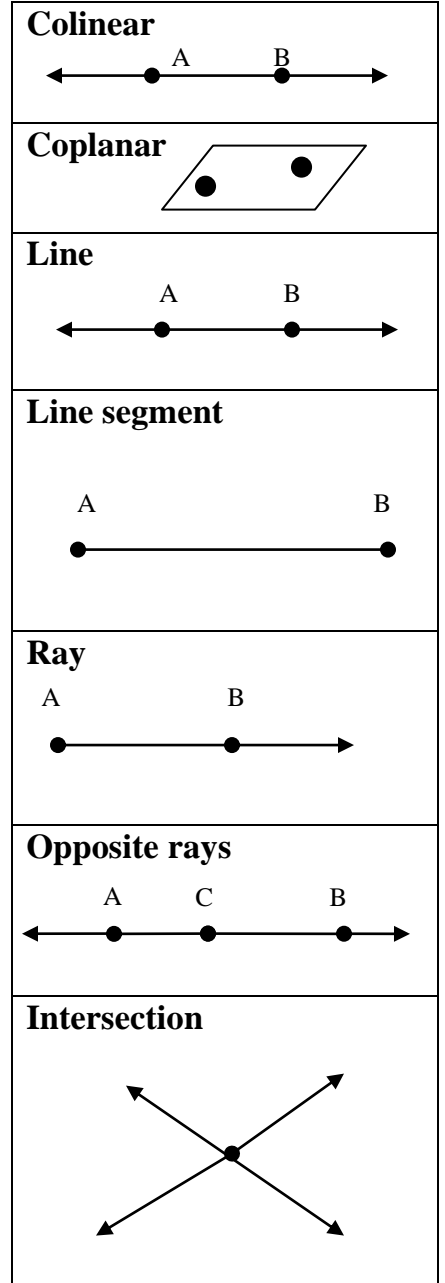
- 1) Select Math, and New Jersey, Press the Go button.
- 2) Select the Geometry 2007 textbook.
- 3) Scroll down select online book.
- 4) Create student account. **Activation code 2539792-150.**  
(After you enter the activation code you may have to press Create student account again.)
- 5) Follow the directions from that point.

6/1/2009

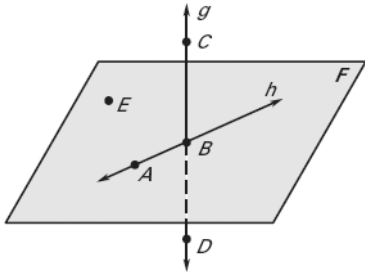
Mathematics Department

## Vocabulary

- **Point** is named by 1 capital letter **Point A** would be written as A
- **Collinear points** are points that lie on the same line.
- **Coplanar points** are points that lie in the same plane.
- **Line AB** (written as  $\overleftrightarrow{AB}$ ) passes through points A and B.
- The **line segment AB**, or **segment AB** (written as  $\overline{AB}$ ), consists of the **endpoints** A and B and all points between A and B.
- The **ray AB** (written as  $\overrightarrow{AB}$ ) It has one endpoint and continues on in one direction. A ray is named with endpoint first.
- If point C lies on  $\overleftrightarrow{AB}$  between A and B, then  $\overrightarrow{CB}$  and  $\overrightarrow{CA}$  are **opposite rays**.
- **Two or more geometric figures intersect** if they have one or more points in common. **The intersection of the figures is the set of points the figures have in common.**
- **Congruent-** lines, angles and figures of equal size and shape

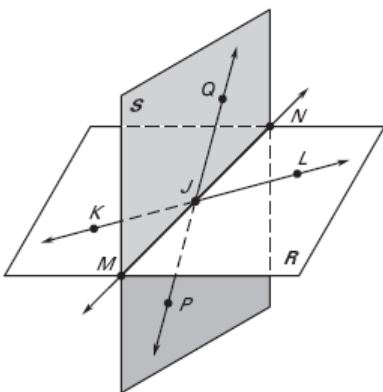


In Exercises 1–8, use the diagram.



1. Give two other names for  $\overleftrightarrow{AB}$ .
2. Name three points that are collinear.
3. Give another name for plane  $F$ .
4. Name a point that is not coplanar with  $A$ ,  $B$ , and  $C$ .
5. Give another name for  $\overline{CD}$ .
6. Name three rays with endpoint  $B$ .
7. Name a pair of opposite rays.
8. Give another name for  $\overrightarrow{CD}$ .

In Exercises 9–16, use the diagram.

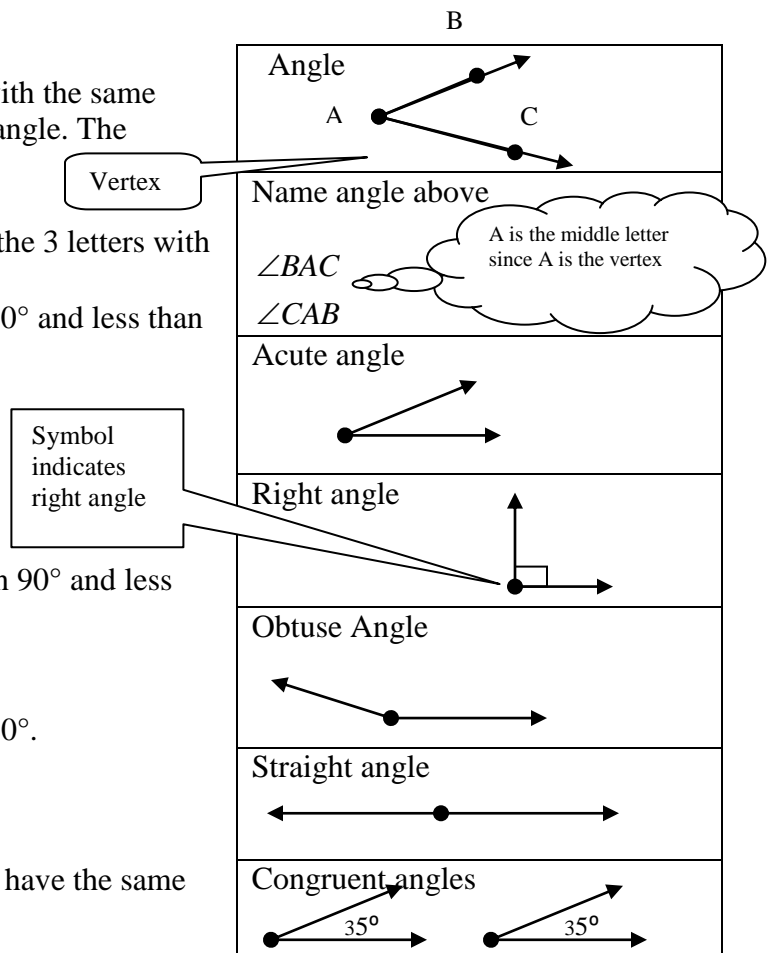


9. Are points  $J$ ,  $K$ , and  $L$  collinear?
10. Are points  $J$ ,  $K$ , and  $L$  coplanar?

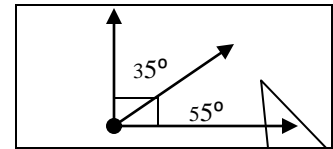
11. Are points  $J$ ,  $K$ , and  $M$  collinear?
12. Are points  $J$ ,  $K$ , and  $M$  coplanar?
13. Name the intersection of  $\overleftrightarrow{KL}$  and  $\overleftrightarrow{PQ}$ .
14. Name the intersection of  $\overleftrightarrow{PQ}$  and plane  $KMN$ .
15. Name the intersection of plane  $R$  and plane  $S$ .
16. Name three pairs of opposite rays.

### Vocabulary

- An **angle** consists of two different rays with the same endpoint. The rays are the **sides** of the angle. The endpoint is the **vertex** of the angle.
- **To Name an Angle**- It can be named by the 3 letters with the vertex as the middle letter.
- An **acute** angle has measure greater than  $0^\circ$  and less than  $90^\circ$ .
- A **right** angle has measure equal to  $90^\circ$ .
- An **obtuse** angle has measure greater than  $90^\circ$  and less than  $180^\circ$ .
- A **straight** angle has measure equal to  $180^\circ$ .
- Two angles are **congruent angles** if they have the same measure.
- An **angle bisector** is a ray that cuts in angle in half.

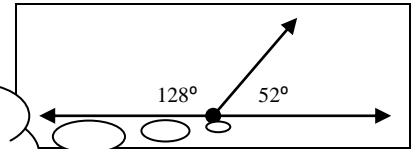


- Two angles are **complementary** if the sum of their measures is  $90^\circ$ .



They are complementary because  $35 + 55 = 90$

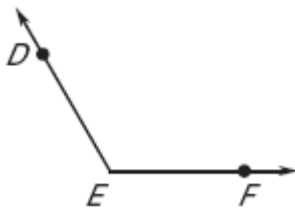
- Two angles are **supplementary** if the sum of their measures is  $180^\circ$ .



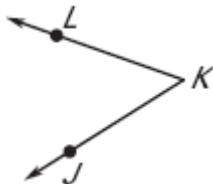
They are supplementary because  $128 + 52 = 180$

For questions #17-19 Write three names for the angle shown. Then name the vertex and sides of the angle.

17.



18.



19.



For questions 20-23 Classify the angle with the given measure as *acute*, *obtuse*, *right*, or *straight*.

20.  $m\angle A = 115^\circ$

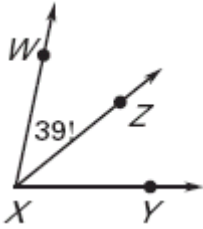
21.  $m\angle A = 85^\circ$

22.  $m\angle A = 90^\circ$

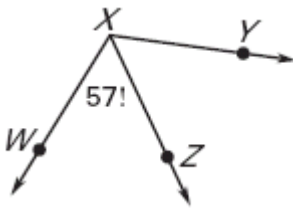
23.  $m\angle A = 170^\circ$

Given that  $\overrightarrow{XZ}$  bisects  $\angle WXY$ , find the two angle measures not given in the diagram for questions 24- 26.

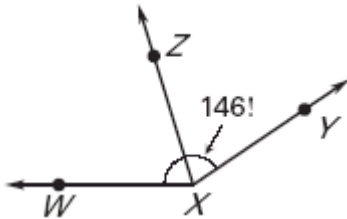
24.



25.



26.



For questions #27-30  $\angle 1$  and  $\angle 2$  are complementary angles. Given the measure of  $\angle 1$ , find  $m\angle 2$ .

27.  $m\angle 1 = 52^\circ$

28.  $m\angle 1 = 76^\circ$

29.  $m\angle 1 = 19^\circ$

30.  $m\angle 1 = 63^\circ$

For questions 31-34  $\angle 1$  and  $\angle 2$  are supplementary angles. Given the measure of  $\angle 1$ , find  $m\angle 2$ .

31.  $m\angle 1 = 147^\circ$

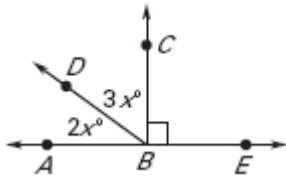
32.  $m\angle 1 = 94^\circ$

33.  $m\angle 1 = 38^\circ$

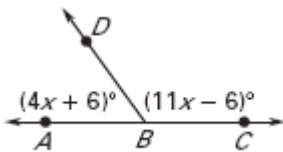
34.  $m\angle 1 = 121^\circ$

In questions 35- 37 Find  $x$ , then Find  $m \angle ABD$  and  $m \angle DBC$ .

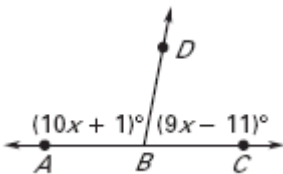
35.



36.



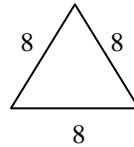
37.



### Vocabulary

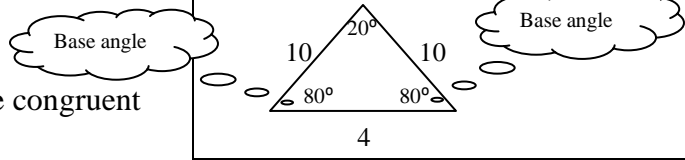
- A **polygon** is a closed plane figure formed by three or more line segments called **sides**. Each side intersects exactly two sides, one at each endpoint, so that no two sides with a common endpoint are collinear. Each endpoint of a side is a **vertex** of the polygon.
- In an **equilateral** polygon, all sides are congruent.
- In an **equiangular** polygon, all angles in the interior of the polygon are congruent.

### Equilateral Triangle

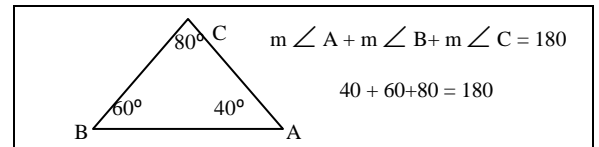


- A polygon is **regular** if all sides and all angles are congruent
- **Equilateral triangle** all sides are equal and all interior angles are  $60^\circ$
- **Isosceles triangle** at least 2 sides are congruent and 2 base angles are congruent.

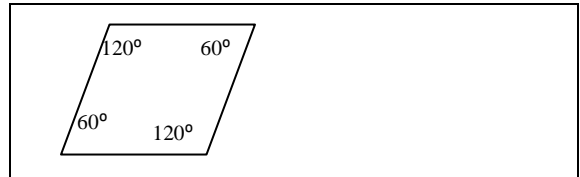
### Isosceles Triangle



- All 3 interior angles of any triangle add up to  $180^\circ$



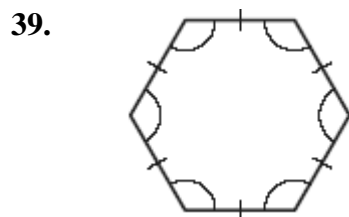
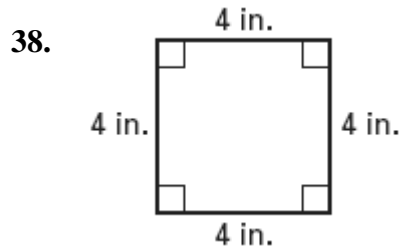
- All 4 interior angles of any quadrilateral add up to  $360^\circ$



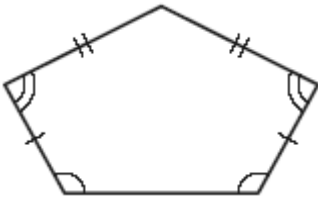
- Name of polygons 3-10

Number of sides	Name
3	Triangle
4	Quadrilateral
5	Pentagon
6	Hexagon
7	Heptagon
8	Octagon
9	Nonagon
10	Decagon

For questions 38- 40, Classify the polygon by the number of sides. Tell whether the polygon is *equilateral*, *equiangular*, or *regular*. Explain your reasoning.

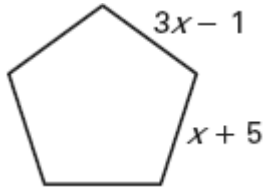


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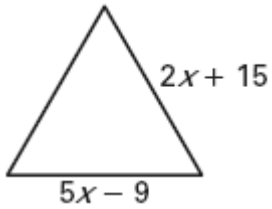


For questions 41-44, each figure is a regular polygon. Expressions are given for two side lengths. Find the value of  $x$ .

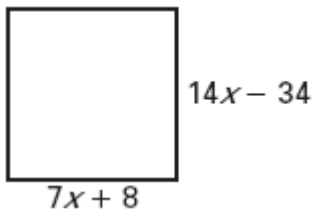
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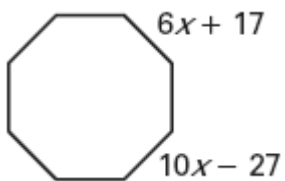
42.



43.



44.



**Vocabulary**

Formulas for the perimeter  $P$ , area  $A$ , and circumference  $C$  of some common plane figures are given below.

**Square**

side length  $s$

$$P = 4s$$

$$A = s^2$$

**Rectangle**

length  $l$  and width  $w$

$$P = 2l + 2w$$

$$A = lw$$

**Triangle**

side lengths  $a$ ,  $b$ , and  $c$ , base  $b$ , and height  $h$

$$P = a + b + c$$

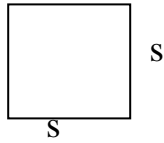

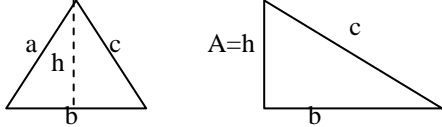
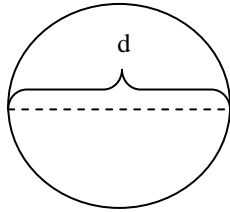
$$A = \frac{1}{2} (b)(h)$$

**Circle**

Diameter  $d$  and radius  $r$ : *Radius =  $\frac{1}{2}$  diameter*

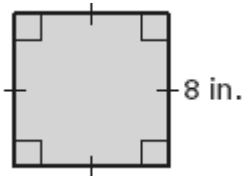
$$C = \pi d = 2\pi r$$

$$A = \pi r^2$$

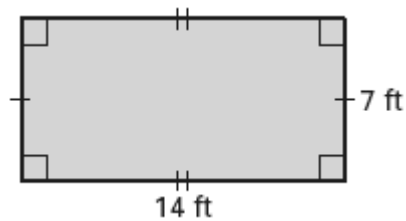
<p><b>Square</b></p> 
<p><b>Rectangle</b></p> 
<p><b>Triangle</b></p> 
<p><b>Circle</b></p> 

Find the perimeter and area of the figure in question 45-50.

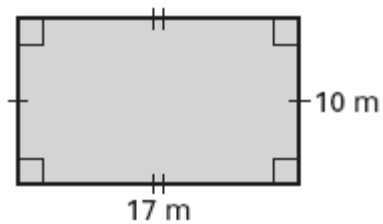
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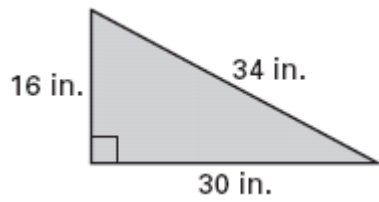
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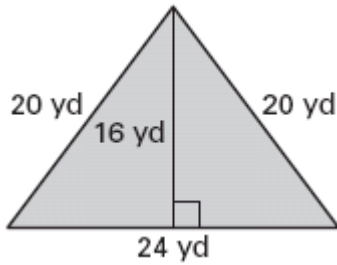
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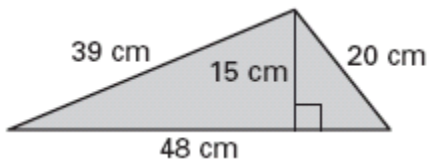
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49.

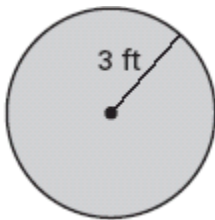


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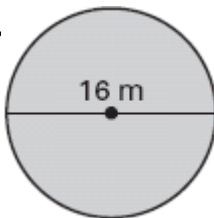


Find the circumference and area of the circle in questions 51-53. Round to the nearest tenth.

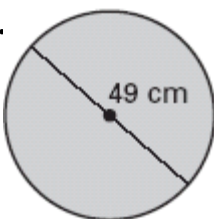
51.



52.



53.



54. A triangle has a base of 4 yards and a height of 12 yards. Find its area.

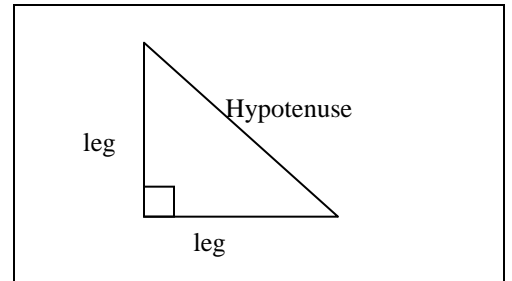
55. A circle has a radius of 11 inches. Find its area. Round your answer to the nearest tenth.

### Vocabulary

Label parts of the right triangle.

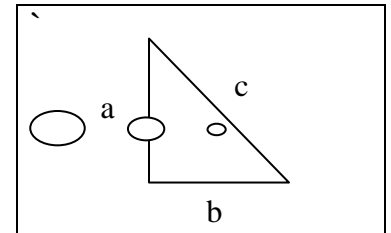
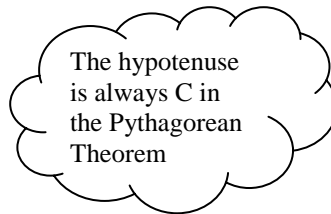
The hypotenuse is opposite the right angle.

The legs



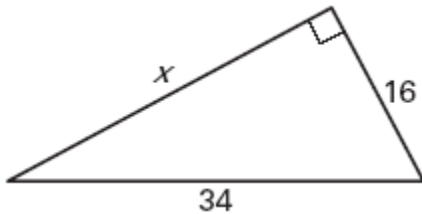
**Theorem 7.1 Pythagorean Theorem:** In a right triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs.

$$a^2 + b^2 = c^2$$

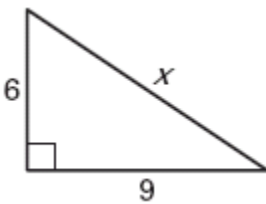


For questions 56-61 identify the unknown side as a *leg* or *hypotenuse*. Then, find the unknown side length of the right triangle. Write your answer in simplest radical form.

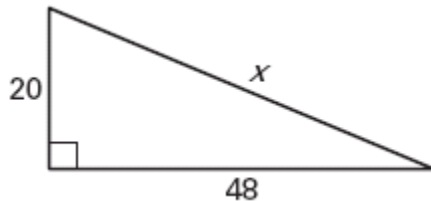
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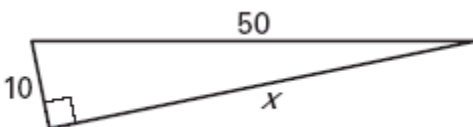
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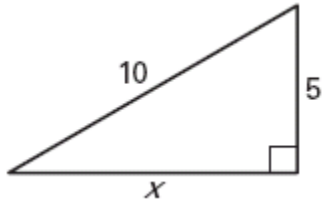
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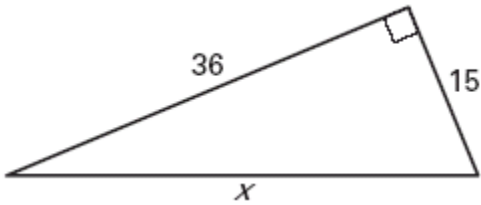
59.



60.



61.



## Algebra skills

Solve for  $x$  for questions 62-74

62.  $2x - 5 = 9$

63.  $\frac{2}{3}x - 1 = 9$

64.  $9 = -4 - x$

65.  $2x - 5 = 4x - 1$

66.  $4 - \frac{3}{5}x = 10$

67.  $x - 2 = -6\frac{3}{5}$

68.  $2(x - 5) - 5 = 19$

69.  $5x - 3(x - 5) = 17$

70.  $\frac{2x-3}{6} = -2$

71.  $2(3x-6) = 6(x+5)$

72.  $2(x-5) - 5 = -15$

73.  $2x-5+5x = 19-3x+3$

74.  $-22+5x = 3x$

Simplify the expression in questions 75- 79: Leave all expressions in simplest radical form.

75.  $-\sqrt{81}$

76.  $\sqrt{48}$

77.  $5\sqrt{40}$

78.  $\sqrt{20} \cdot 2\sqrt{15}$

79.  $\sqrt{\frac{25}{16}}$

Factor Completely for questions 80-87

80.  $x^2 - 9$

81.  $x^2 + 8x + 15$

82.  $3x^2 - x - 2$

83.  $16x - 32$

84.  $x^2 - 35xy - 36y^2$

85.  $3x^2 - 27$

86.  $2x^2 - 5x - 12$

87.  $4x^2 + 12x + 9$

For questions 88-91 Solve the equation or write no real solution. Write answers in simplest radical form.

88.  $x^2 = 20$

89.  $4x^2 = -32$

90.  $x^2 = 8x$

91.  $x^2 - 7x + 10 = 0$

For questions 92-94 you are given an equation of a line and a point. Use substitution to determine whether the point is on the line.

92.  $y = x + 4$ ;  $A(3, 7)$

93.  $y = x - 5$ ;  $A(1, 6)$

94.  $y = -x - 2$ ;  $A(-8, -10)$

## Algebra 1 Checklist

You should have mastered these skills by the end of Algebra 1

Adding and subtracting real numbers  
Multiplying and dividing real numbers  
Solving for  $x$  and  $y$  in linear equations  
Solving literal equations for an indicated variable  
Using  $x$ - and  $y$ -intercepts to draw linear graphs  
Using slopes and coordinate pairs to draw linear graphs  
Graphing linear equations in slope-intercept form  
Writing equations in standard form  
Writing equations in slope-intercept form  
Writing equations in point-slope form  
Solving absolute-value equations  
Graphing absolute-value equations  
Writing linear equations in function form  
Graphing linear and absolute value functions using transformations  
Solving linear inequalities  
Graphing linear inequalities  
Solving systems of linear equations  
Solving systems of linear inequalities  
Graphing linear systems  
Simplifying exponents  
Writing numbers in scientific notation  
Simplifying square roots  
Solving equations that involve square roots  
Using the Pythagorean theorem  
Using the quadratic formula  
Graphing quadratic equations  
Adding and subtracting polynomials  
Multiplying polynomials  
Factoring polynomials  
Graphing exponential growth and decay functions  
Solve problems involving simple and compound interest