

- 1) **[Directions:]** Do all problems in this packet. This assignment is due the first day of school regardless of whether you have math in the fall or in the spring. Please take the completed assignment to your assigned teacher on the first day of school. You will receive a completion grade for the assignment. Necessary work should be shown. Problems with answers and no work will not count towards the completion grade. Do not rush through the packet. Give yourself time to process and remember the skills. Please note that all of the material was covered in previous math classes. This work will be reviewed during the first week and will count as your first TEST grade. Below are some websites that contain videos or notes on skills that you may need to review.

1. khanacademy.org
2. youtube.com
3. coolmath.com
4. purplemath.com

**Evaluate each function.**

2)  $f(x) = x^2 + x$ ; Find  $f(-3)$

6

3)  $h(x) = -3x^2 + 4$ ; Find  $h(-3x)$

$-27x^2 + 4$

**Find the domain of the function.**

4)  $\frac{r^2 - 11r + 24}{r - 3}$

$(-\infty, 3) \cup (3, \infty)$

**Evaluate the expression, given  $x = -2$ ,  $y = 3$ , and  $a = -4$ .**

5)  $\frac{4x - 5}{3y + a} - \frac{13}{5}$

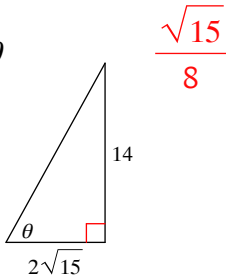
**Find the length of the missing side of a right triangle.**

- 6) Given the length of the hypotenuse of a right triangle is 41 cm, and one of the other sides is 9 cm, find the length of the third side, rounded to two decimal places.

40 cm

**Use the Pythagorean Theorem to find the length of the missing side. Find the value of the trig function indicated. Give an exact answer with a rational denominator.**

7)  $\cos \theta$



Use a calculator to find the value of the acute angle  $\theta$  to the nearest degree.

8)  $\sin \theta = 0.8290$

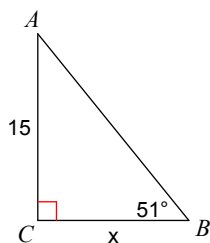
$56^\circ$

9)  $\cos \theta = 0.0523$

$273^\circ$

Find the measure of each side indicated. Round to the nearest tenth.

10)



$12.1$

In each triangle ABC, angle C is a right angle. Find the value of the trig function indicated. Give an exact answer with a rational denominator.

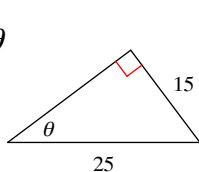
11) Find  $\tan A$  if  $c = 24$ ,  $a = 8$   $\frac{\sqrt{2}}{4}$

12) Find  $\sin A$  if  $c = 6\sqrt{17}$ ,  $a = 6$   $\frac{\sqrt{17}}{17}$

13) Find  $\cos A$  if  $a = 5$ ,  $c = 19$   $\frac{4\sqrt{21}}{19}$

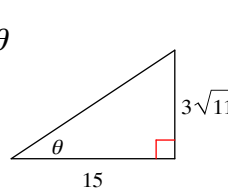
Find the value of the trig function indicated.

14)  $\sin \theta$



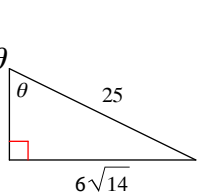
$\frac{3}{5}$

15)  $\cos \theta$



$\frac{5}{6}$

16)  $\tan \theta$



$\frac{6\sqrt{14}}{11}$

Solve the problem.

17) A ladder leans against a building. The base of the ladder is 6 ft from the building and makes a  $62^\circ$  angle with the ground. How tall is the ladder? Round your answer to the nearest tenth.

$11.3$  ft

Use a calculator to find the value of the acute angle  $\theta$  to the nearest degree.

18)  $\sin \theta = 0.7880$

$128^\circ$

19)  $\cos \theta = -0.8387$

$147^\circ$

20)  $\tan \theta = 1.8807$

$242^\circ$

**Simplify. Your answer should contain only positive exponents.**

$$21) \frac{2a^3b^{-1}}{(2ba^{-1})^2 \cdot (2b^3)^{-2}}$$
$$2a^5b^3$$

**Solve each equation by completing the square.**

$$22) p^2 + 18p - 61 = 2$$
$$\{3, -21\}$$

**Find the area.**

23) Find the area of a triangle with a height of 9 feet and a base of 12 feet.

54 square feet

**Solve each equation. Remember to check for extraneous solutions.**

$$24) \sqrt{8r + 1} + 8 = 17$$
$$\{10\}$$

**Evaluate the expression.**

$$25) \sqrt{100} - 36$$
$$8$$

**Simplify.**

$$26) \sqrt{15} \cdot \sqrt{20}$$
$$10\sqrt{3}$$

$$27) \sqrt{25} \cdot 2\sqrt{4}$$
$$20$$

$$28) \sqrt[3]{135m^5}$$
$$3m\sqrt[3]{5m^2}$$

**Solve the problem.**

29) For a culture of 80,000 bacteria of a certain strain, the number of bacteria  $N$  will survive  $x$  hours is modeled by the formula  $N = 6000\sqrt{100 - x}$ . After how many hours will 52,000 bacteria survive? Round your answer to the nearest tenth of an hour.

24.9 hours

**Solve each equation by using a calculator.**

$$30) 7v^2 + 12 = 25v$$
$$\left\{\frac{4}{7}, 3\right\}$$

**Solve each equation by factoring.**

31)  $5b^2 = 65b - 200$

$\{5, 8\}$

32)  $7a^2 + 14 = 21a$

$\{1, 2\}$

**Solve each equation.**

33)  $11 - 2m = -2(-3m - 2) - 7m$

$\{7\}$

**Solve each equation by factoring.**

34)  $84n^2 + 188n = -80$

$\left\{-\frac{5}{3}, -\frac{4}{7}\right\}$

**Factor each completely.**

35)  $5x^3 - 25x^2 + 8x - 40$

$(5x^2 + 8)(x - 5)$

36)  $3r^3 - 6r^2 - 2r + 4$

$(3r^2 - 2)(r - 2)$

37)  $2v^3 - 8v^2 - 120v$

$2v(v - 10)(v + 6)$

38)  $5n^2 + 35n + 30$

$5(n + 6)(n + 1)$

39)  $32x^4 - 120x^3 + 100x^2$

$4x^2(4x - 5)(2x - 5)$

40)  $9m^2 - 10m - 16$

$(m - 2)(9m + 8)$

41)  $10x^3 + 70x^2$

$10x^2(x + 7)$

42)  $9x^3 + 67x^2 - 40x$

$x(x + 8)(9x - 5)$

43)  $-9x^2 + 54x$

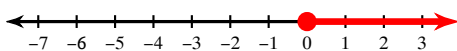
$-9x(x - 6)$

44)  $20x^3 - 14x^2 - 12x$

$2x(2x + 1)(5x - 6)$

**Solve each inequality and graph its solution.**

45)  $-5n - 4(n - 1) \leq -2(-5n - 2)$



$n \geq 0$

**Simplify each expression.**

46)  $(2 + 8n^4 - 2n) - (4n^4 + 5n + 7 - 7n^2)$

$4n^4 + 7n^2 - 7n - 5$

47)  $(7 + 6a^2 - 8a) - (6a + 2a^2 - 8 - 3a^3)$

$3a^3 + 4a^2 - 14a + 15$

**Find each product.**

48)  $(5x - 6y)(8x - 5y)$

$40x^2 - 73xy + 30y^2$

49)  $(4k - 5)^2$

$16k^2 - 40k + 25$

50)  $(7n + 5)(7n - 5)$

$49n^2 - 25$

**Factor completely.**

$$51) 36nm^2 - 4n^3$$
$$4n(3m + n)(3m - n)$$

$$52) 64x^3 - 27$$
$$(4x - 3)(16x^2 + 12x + 9)$$

**Prove the given functions are inverses or not.**

$$53) g(n) = \frac{2 + \sqrt[5]{16n}}{2}$$
$$f(n) = 2(n - 1)^5$$

Yes

$$54) f(x) = \sqrt[5]{\frac{-x + 3}{2}}$$
$$g(x) = 1 + x^3$$

No

**Find the inverse of each function.**

$$55) f(n) = -2 + \frac{3}{5}n$$
$$f^{-1}(n) = \frac{5}{3}n + \frac{10}{3}$$

56) If the following defines a one-to-one function, find the inverse.

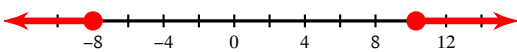
$$\{(6, -10), (9, -9), (7, -8), (5, -7)\}$$
$$\{(-10, 6), (-9, 9), (-8, 7), (-7, 5)\}$$

**Solve the compound inequality. Write your answer in inequality notation.**

$$57) 5 < 4 - 3x \leq 13 \quad -3 \leq x < -\frac{1}{3}$$

**Solve each inequality and graph its solution.**

$$58) |8 - 7n| \geq 64$$



$$n \leq -8 \text{ or } n \geq \frac{72}{7}$$

**Simplify. Rationalize the denominator.**

$$59) \frac{\sqrt{4}}{5\sqrt{5}} \cdot \frac{2\sqrt{5}}{25}$$

**Evaluate the algebraic expression for the given value or values of the variable(s).**

$$60) (x + 3y)^2, x = 3 \text{ and } y = -4$$

81

**Solve the linear equation.**

61)  $-5x - 3 = 14$   
 $-17/5$

62)  $\frac{x}{4} = \frac{x}{9} + 1$   
 $57.6$

**Find each product.**

63)  $(4x - 5y)(2x - 7y)$   
 $8x^2 - 38xy + 35y^2$

**Simplify. Your answer should contain only positive exponents.**

64)  $\frac{x^4 \cdot x^{-4} y^4}{(2x^{-2} y^{-4})^2 \cdot 2x^4 y^3} \cdot \frac{y^9}{8}$

**Find the vertex and axis of symmetry of the graph of the function.**

65)  $f(x) = -2x^2 + 4x - 5$  v:(1, -3)  
aos:  $x = 1$

**Factor each and find the real zeros.**

66)  $f(x) = 4x^3 - 20x^2 + x - 5$   
Factors to:  $f(x) = (x - 5)(4x^2 + 1)$   
Zeros:  $\left\{5, \frac{i}{2}, -\frac{i}{2}\right\}$

**Simplify.**

67)  $\frac{7 + 4i}{8 + 9i} \cdot \frac{92 - 31i}{145}$

68)  $(6i) + (-8 + 7i) + (8i)$   
 $-8 + 21i$

69)  $(-5i)(-4 - 5i)$   
 $-25 + 20i$

**Find the discriminant of each quadratic equation then state the number and type of solutions.**

70)  $9n^2 - 2n + 7 = 3$   
 $-140$ ; two imaginary solutions

71)  $4r^2 + 2 = 6$   
 $64$ ; two real solutions

72)  $x^2 - 2x + 7 = 6$   
 $0$ ; one real solution

**Simplify. Write the result in standard form.**

73)  $\sqrt{-100}$   
 $10i$

Solve each equation by the method of your choice.

74)  $15a^2 - 34a = -15$

$$\left\{ \frac{5}{3}, \frac{3}{5} \right\}$$

Solve each equation by taking square roots.

75)  $7x^2 + 2 = -93$   $\left\{ \frac{i\sqrt{665}}{7}, -\frac{i\sqrt{665}}{7} \right\}$

Solve the quadratic equation by the square root property.

76)  $(x - 5)^2 = 4$

$$\{7, 3\}$$

Solve each equation by the method of your choice.

77)  $x^2 = 12 - 4x$

$$\{-6, 2\}$$

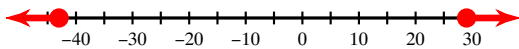
Solve each equation.

78)  $|m + 10| = 1$

$$\{-9, -11\}$$

Solve each inequality and graph its solution.

79)  $\frac{|p + 7|}{9} \geq 4$



$$p \geq 29 \text{ or } p \leq -43$$

Simplify.

80)  $\sqrt{128}$

$$8\sqrt{2}$$

81)  $\sqrt{54}$

$$3\sqrt{6}$$

Simplify. Your answer should contain only positive exponents.

82)  $2x^3 \cdot 4yx^{-3}$

$$8y$$

83)  $\frac{4x^{-3}y^{-2}}{xy^{-2}} \cdot \frac{4}{x^4}$

Simplify.

84)  $(b^3)^3 \cdot b^0$

$$b^9$$

**Solve the problem.**

85) The height of a golf ball in the air can be modeled by the equation  $h = -16t^2 + 76t$ , where  $h$  is the height in feet of the ball after  $t$  seconds.

- a. 4.75 seconds
- b. about 90 feet
- c. about 2.4 seconds

- a. How long was the ball in the air.
- b. What is the ball's maximum height.
- c. When will the ball reach its maximum height?

86) The area,  $A$ , in square feet of a projected picture on a movie screen can be modeled by the equation  $A = 0.25d^2$ , where  $d$  represents the distance from a projector to a movie screen. At what distance will the projected picture have an area of 100 square feet?

20 feet

87) The table below shows the height  $h$  (in feet) of a hammer  $t$  seconds after it was dropped from the top of a building by a construction worker.

- a.  $y = -16x^2 - 384x + 384$
- b. about 4.9 seconds

| Time(t) | Height (h) |
|---------|------------|
| 0       | 384        |
| 0.5     | 380        |
| 1       | 368        |
| 1.5     | 348        |
| 2       | 320        |

- a. Find an equation for the curve of best fit.
- b. How long will it take the hammer to reach the ground?

88) On the first four exams, your grades are 77, 94, 59, and 78. You are hoping to earn a C in this course. This will occur if the average of your five exam grades is greater than or equal to 70 and less than 80. What range of grades on the fifth exam will result in earning a C?

$$42 \leq x < 92$$

**Write an equation in point-slope form of the line satisfying the given conditions.**

89) The line through (-1, 5) with slope of -3

$$y - 5 = -3(x + 1)$$

**Write an equation of the line given the following.**

90) The horizontal line through the point  $(-4, \frac{1}{2})$

$$y = \frac{1}{2}$$

91) through (2, -3), and parallel to  $3x - y = 1$

$$y = 3x - 9$$

92) y-intercept of -4 and perpendicular to  $-3x - 4y = 2$

$$y = \frac{4}{3}x - 4$$

**Evaluate each function.**

93)  $w(a) = a^2 - 1$ ; Find  $w(3 - x)$

$$8 - 6x + x^2$$

94)  $p(a) = a^2 - a$ ; Find  $p(9)$

$$72$$



Identify the domain and range of each.

95)  $y = \sqrt{x}$

Domain:  $x \geq 0$

Range:  $y \geq 0$

Write the equation.

96) The graph of  $f(x) = x^2$ , is shifted left 2 units and up 3 units.

$$g(x) = (x + 2)^2 + 3$$

97) The graph of  $f(x) = x^2$ , is shifted right 4 units and reflected across the x-axis

$$g(x) = -(x + 4)^2$$

Describe the transformation.

98)  $y = 0.2|x - 3| + 2.4$  right 3  
vertical compression of 0.2  
up 2.4

99)  $y = 4\sqrt{x - 4} + 1$  right 4  
vertical stretch by 4  
up 1

Solve each equation by completing the square.

100)  $b^2 - 18b - 32 = -9$

$$\{9 + 2\sqrt{26}, 9 - 2\sqrt{26}\}$$

101)  $b^2 - 8b - 10 = 10$

$$\{10, -2\}$$

Solve each equation with the quadratic formula.

102)  $7n^2 - 9n = 21$

$$\left\{ \frac{9 + \sqrt{669}}{14}, \frac{9 - \sqrt{669}}{14} \right\}$$

103)  $4n^2 = 5n + 125$

$$\left\{ \frac{25}{4}, -5 \right\}$$

Solve each equation by factoring.

104)  $n(3n + 1) = 0$

$$\left\{ -\frac{1}{3}, 0 \right\}$$

105)  $(4x - 1)(x - 7) = 0$

$$\left\{ \frac{1}{4}, 7 \right\}$$

Solve by taking the square root.

106)  $2(x + 6)^2 = 128$

$$\{2, -14\}$$

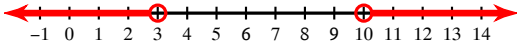
Solve each equation by taking square roots.

107)  $2v^2 - 2 = 94$

$$\{4\sqrt{3}, -4\sqrt{3}\}$$

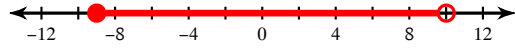
Solve each compound inequality and graph its solution.

108)  $10 - 5k > -5$  or  $-1 - k < -11$



$k < 3$  or  $k > 10$

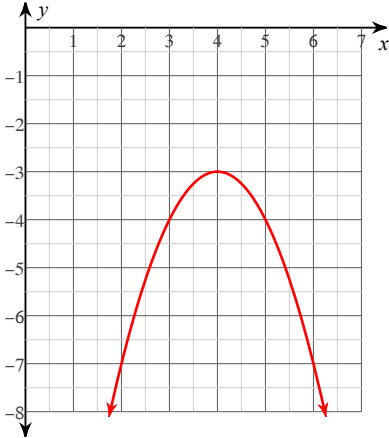
109)  $-1 - 2x \leq 17$  and  $5x - 5 < 45$



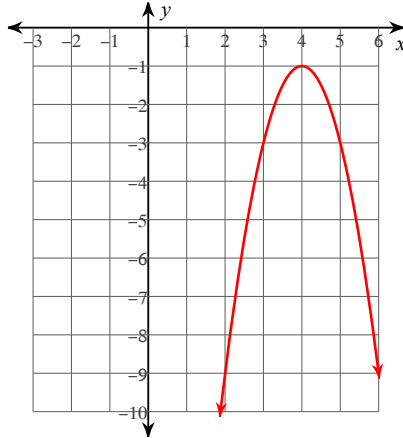
$-9 \leq x < 10$

Sketch the graph of each function. Label the vertex and the line of symmetry.

110)  $y = -x^2 + 8x - 19$

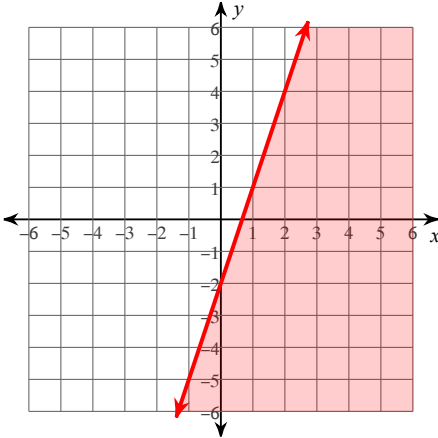


111)  $y = -2x^2 + 16x - 33$



Sketch the graph of each linear inequality.

112)  $y \leq 3x - 2$



113)  $y > -4x + 3$

