

Intermediate Algebra final Exam Review Guide

Name _____

Find the value of the algebraic expression at the given replacement value.

1) $4x + y$ when $x = 3$ and $y = -1$

2) The algebraic expression $2.7x$ gives the total weight in pounds of x tents of a certain type. Find the total weight of 4 tents.

Add or subtract as indicated.

3) $5 - 12$

4) $-1 - 4$

5) $-12 - (-9)$

6) $\frac{2}{3} - \left(-\frac{1}{6}\right)$

Multiply or divide as indicated.

7) $(-6)(-3)(3)$

8) $\left(-\frac{14}{18}\right) \cdot \left(\frac{2}{7}\right)$

9) $\frac{25}{0}$

10) $\frac{5}{6} \div \left(-\frac{5}{12}\right)$

Evaluate.

11) $(-7)^2$

12) $\sqrt{\frac{1}{64}}$

13) $\sqrt{25}$

Simplify the expression.

14) $2[-6 + 3(-5 + 4)]$

15) $5x + 7 + 2x + 8$

16) $-14 - (6y - 4)$

Find the value of the algebraic expression at the given replacement value.

17) $5(x + 2) + 23$ when $x = -11$

Solve the equation.

18) $3x - 4 = 23$

19) $7x + 5 = 2x + 45$

20) $2x - 7 = 3(x - 4)$

21) $\frac{x}{3} - \frac{x}{4} = 6$

22) $7x + 2 + 4x + 4 = 7x + 4x + 6$

Write the solution set using interval notation.

23) $-9 - 3x \leq 9$

24) $9x + 9 \geq 6x - 9$

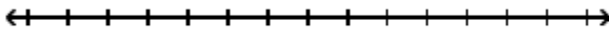
Solve.

25) A student scored 69, 76, and 99 on three algebra tests. What must he score on the fourth test in order to have an average grade of at least 85?

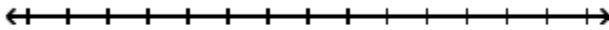
26) A student scored 80, 95, and 65 on three algebra tests. What must he score on the fourth test in order to have an average grade of at least 80?

Solve the compound inequality. Graph the solution set.

27) $6 < 2x \leq 12$



28) $9x - 6 < 3x$ or $-2x \leq -6$

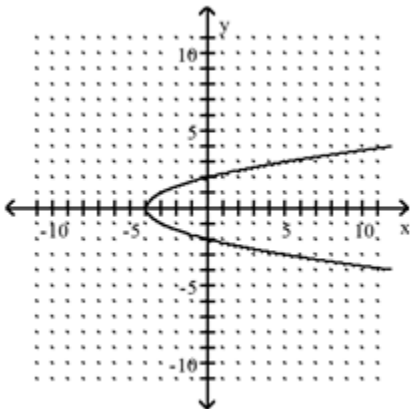


Solve the absolute value equation.

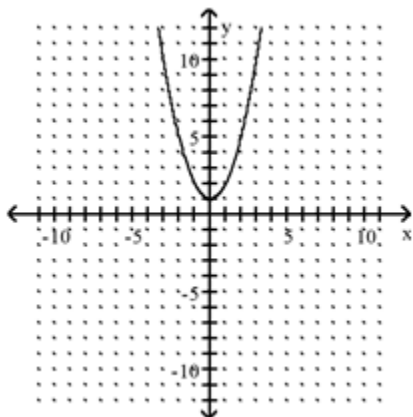
29) $|6x + 5| + 5 = 14$

Determine whether the following graphs are functions.

30)



31)

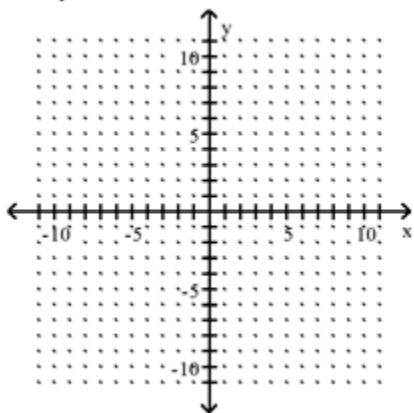


Find the indicated value.

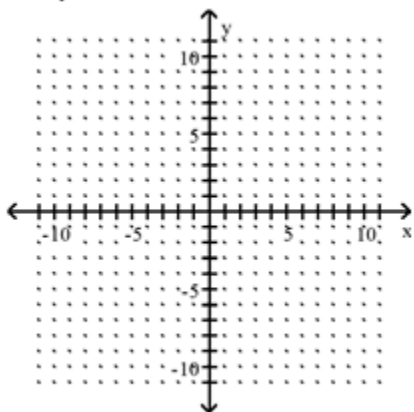
32) Find $f(-3)$ when $f(x) = 2x^2 + 4x - 1$

Graph the inequality.

33) $5x + y > 2$



34) $6x \leq 2y + 4$



Solve the system of equations.

35)
$$\begin{cases} 2x - 3y = 10 \\ x = 4y \end{cases}$$

36)
$$\begin{cases} 6x + 2y = 28 \\ 2x + 2y = 36 \end{cases}$$

Simplify. Write the answer with positive exponents.

37) $y^6 \cdot y^3$

38) $-7x^7 \cdot 5x^3$

39) $(-10)^0$

40) $\frac{x^9 y^{13}}{x^5 y^7}$

41) $\frac{x^{-6}}{x^2}$

Write the number in scientific notation.

42) 0.00003197

Write the number in standard notation

43) 7.25×10^6

Simplify. Write the answer in with positive exponents.

44) $(5x)^3$

45) $(x^{-5}y^5)^{-2}$

Perform the indicated operations.

46) $(9x^9 - 8x^4) + (5x^6 - 7x^4 - 6)$

47) $(5x - 1) - (-x - 5)$

Multiply

48) $(-4x + 3)(2x - 1)$

49) $(x - 13)^2$

50) $(x + 3)(x - 3)$

Factor the polynomial completely.

51) $55x^3 - 11x$

52) $20x^4 + 32x^2$

53) $x^2 - x - 56$

54) $7x^2 + 20x - 3$

55) $x^2 + 6x + 9$

56) $64x^2 - 9$

Solve the equation.

57) $x^2 + 4x - 21 = 0$

58) $(x - 2)(x + 3) = 0$

Multiply or divide as indicated. Simplify completely.

$$59) \frac{2x-2}{x} \cdot \frac{2x^2}{5x-5}$$

$$60) \frac{2x^2}{5} \cdot \frac{15}{x^3}$$

$$61) \frac{5x-5}{x} \div \frac{7x-7}{3x^2}$$

Perform the indicated operation. Simplify if possible.

$$62) \frac{20}{23x} - \frac{6}{23x}$$

$$63) \frac{8x^2}{x-1} + \frac{-8x}{x-1}$$

$$64) \frac{2}{r} + \frac{7}{r-3}$$

Use radical notation to write the expression. Simplify if possible.

$$65) 64^{1/2}$$

Use the product rule to multiply. Assume all variables represent positive real numbers.

$$66) \sqrt{6} \cdot \sqrt{7}$$

Use the quotient rule to divide and simplify.

$$67) \frac{\sqrt{84}}{\sqrt{3}}$$

Simplify the radical expression. Assume that all variables represent positive real numbers.

$$68) \frac{\sqrt{140}}{\sqrt{5}}$$

$$69) \frac{\sqrt{x^9}}{\sqrt{36}}$$

70) $\sqrt{12}$

71) $\sqrt{63}$

Find the distance between the pair of points.

72) $(2, -7)$ and $(4, -3)$

73) $(-6, -7)$ and $(3, -1)$

74) $7\sqrt{5} + 6\sqrt{45}$

75) $\sqrt{18} - 5\sqrt{2}$

76) $\sqrt{7}(\sqrt{3} + \sqrt{5})$

77) $(\sqrt{10} + 2)(\sqrt{10} - 2)$

Rationalize the denominator and simplify. Assume that all variables represent positive real numbers.

78) $\sqrt{\frac{1}{5}}$

79) $\frac{7\sqrt{2}}{\sqrt{11}}$

Solve

80) $\sqrt{x+1} = 4$

81) $\sqrt{3x+2} - 9 = 0$

Use Quadratic Formula to solve the equation.

82) $x^2 - 14x + 45 = 0$

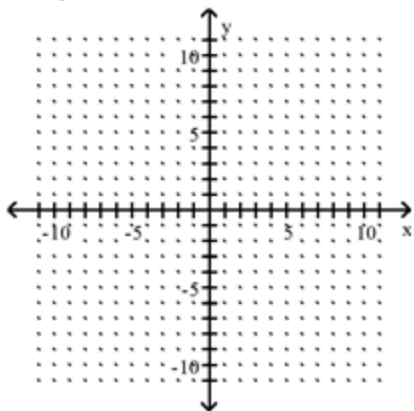
83) $6x^2 = -12x - 2$

Sketch the graph of the quadratic function. Give the vertex and the axis of symmetry.

84) $f(x) = (x + 5)^2 - 3$

Vertex:

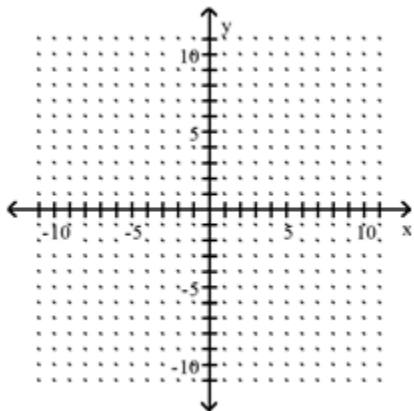
Axis of Symmetry:



85) $f(x) = x^2 + 4$

Vertex:

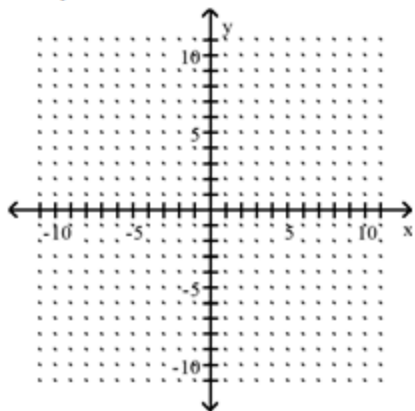
Axis of Symmetry:



86) $f(x) = x^2 - x - 6$

Vertex:

Axis Symmetry:



SCROLL DOWN FOR ANSWER KEYS

1) 11

2) 10.8 lb

3) -7

4) -5

5) -3

6) $\frac{5}{6}$

7) 54

8) $-\frac{2}{9}$

9) 0

10) -2

11) 49

12) $\frac{1}{8}$

13) 5

14) -18

15) $7x + 15$

16) $-6y - 10$

17) -22

18) 9

19) 8

20) 5

21) 72

22) "Infinite number of solutions" or "All Real Numbers", or $(-\infty, \infty)$

23) $[-6, \infty)$

24) $[-6, \infty)$

25) 96

26) 80

27) $(3, 6]$

28) $(-\infty, 1) \cup [3, \infty)$

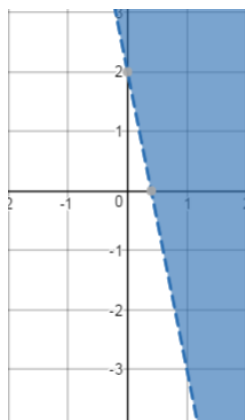
29) $\left\{\frac{2}{3}, -\frac{7}{3}\right\}$

30) Not a function

31) Function

32) 5

33) **Look for:** slope is negative, $-5/1$; y-intercept is 2; line is dotted; shaded area to the right of the line



34) **Look for:** slope is positive, $3/1$; y-intercept is -2; line is solid; shaded area to the left of the line



35) $(8, 2)$

36) $(-2, 20)$

37) y^9

38) $-35x^{10}$

39) 1

40) x^4y^6

41) $\frac{1}{x^8}$

42) 3.197×10^{-5}

43) 7,200,000

44) $125x^3$

45) $\frac{x^{10}}{y^{10}}$

46) $9x^9 + 5x^6 - 15x^4 - 6$

47) $6x + 4$

48) $-8x^2 + 10x - 3$

49) $x^2 - 26x + 169$

50) $x^2 - 9$

51) $11x(5x^2 - 1)$

52) $4x^2(5x^2 + 8)$

53) $(x + 7)(x - 8)$

54) $(7x - 1)(x + 3)$

55) $(x + 3)^2$ or $(x + 3)(x + 3)$

56) $(8x + 3)(8x - 3)$

57) $\{-7, 3\}$

58) $\{2, -3\}$

59) $\frac{4x}{5}$

60) $\frac{6}{x}$

$$61) \frac{15x}{7}$$

$$62) \frac{14}{23x}$$

$$63) 8x$$

$$64) \frac{9r-6}{r(r-3)}$$

$$65) 8$$

$$66) \sqrt{42}$$

$$67) 2\sqrt{7}$$

$$68) 2\sqrt{7}$$

$$69) \frac{x^4\sqrt{x}}{6}$$

$$70) 2\sqrt{3}$$

$$71) 3\sqrt{7}$$

$$72) 2\sqrt{5} \text{ units}$$

$$73) 3\sqrt{13} \text{ units}$$

$$74) 25\sqrt{5}$$

$$75) -2\sqrt{2}$$

$$76) \sqrt{21} + \sqrt{35}$$

$$77) 6$$

$$78) \frac{\sqrt{5}}{5}$$

$$79) \frac{7\sqrt{22}}{11}$$

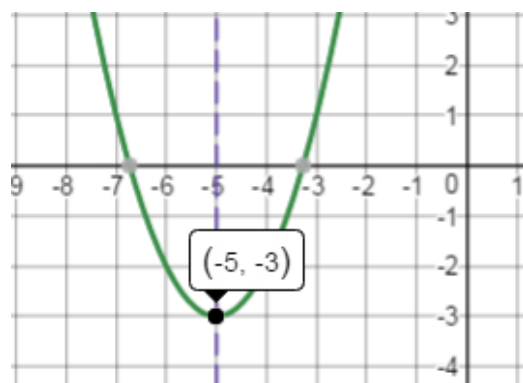
$$80) 15$$

$$81) \frac{79}{3}$$

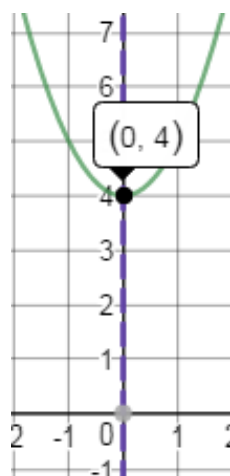
$$82) \{5, 9\}$$

83) $\frac{-3 \pm \sqrt{6}}{3}$ or $-1 \pm \frac{\sqrt{6}}{3}$

84)



85)



86)

