

Name: _____

Summer work for students entering Honors Precalculus

Multiple Choice

Identify the choice that best completes the statement or answers the question. **SHOW ALL POSSIBLE WORK NEXT TO THE PROBLEM!!**

_____ 1. Perform the indicated operation. You may not use a calculator. Show all work.

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

a. $\frac{1}{3}$

d. $\frac{5}{29}$

b. $\frac{5}{36}$

e. $\frac{5}{8}$

c. $\frac{5}{22}$

_____ 2. Perform the indicated operation. You may not use a calculator. Show all work.

$$2 - \frac{7}{8}$$

$$\frac{1}{2} - \frac{1}{5}$$

a. $\frac{15}{4}$

d. $\frac{41}{12}$

b. $\frac{43}{12}$

e. $\frac{47}{12}$

c. $\frac{49}{12}$

_____ 3. List the elements of the given set that are rational numbers.

$$\left\{0, -9, 43, \frac{24}{7}, 0.535, \sqrt{6}, 1.2\bar{5}, -\frac{1}{5}, \sqrt[3]{6}\right\}$$

a. $0, -9, 43, \frac{24}{7}, 0.535, 1.2\bar{5}, \sqrt[3]{6}$

d. $0, -9, 43, \frac{24}{7}, 0.535, 1.2\bar{5}, \sqrt{6}$

b. $0, -9, 43, \frac{24}{7}, 0.535, 1.2\bar{5}$

e. $0, -9, 43, \frac{24}{7}, 0.535, 1.2\bar{5}, -\frac{1}{5}$

c. $-9, 43, \frac{24}{7}, 0.535, \sqrt[3]{6}$

_____ 4. Use properties of real numbers to write the following expression without parentheses.

$$-\frac{3}{2}(6x - 8y)$$

a. $12y - 9x$

d. $12x - 9y$

b. $9x - 12y$

e. $9x + 12y$

c. $9y - 12x$

_____ 5. Select the correct statement. You may not use a calculator. Show all work.

a. $\frac{5}{8} < \frac{4}{7}$

d. $-\frac{8}{5} > \frac{7}{4}$

b. $-\frac{5}{8} > -\frac{4}{7}$

e. $-\frac{8}{5} < -\frac{7}{4}$

c. $\frac{5}{8} > \frac{4}{7}$

_____ 6. Write the statement "**a is greater than or equal to 6**" as an inequality.

a. $a < 6$

d. $a \leq 6$

b. $a \geq 6$

e. $0 \leq a \leq 6$

c. $a > 6$

_____ 7. Evaluate the expression $||-10| - |-9||$. You may not use a calculator. Show all work.

a. 19

d. 0

b. 1

e. -19

c. -1

_____ 8. Find the distance between the numbers -8 and 6.

a. -2

d. 14

b. 2

e. -14

c. 7

_____ 9. Write the exponential expression using radicals.

$10^{-\frac{9}{2}}$

a. $\sqrt[9]{10^2}$

d. $\frac{1}{\sqrt{10^9}}$

b. $-\sqrt{10^9}$

e. $\frac{1}{\sqrt[9]{10^2}}$

c. $\sqrt{10^9}$

_____ 10. Evaluate the expression. You may not use a calculator. Show all work.

$\left(\frac{3}{4}\right)^{-3}$

a. $-\frac{27}{64}$

d. $-\frac{64}{27}$

b. $\frac{1}{27}$

e. $\frac{27}{64}$

c. $\frac{64}{27}$

_____ 11. Evaluate the expression. You may not use a calculator. Show all work.

$\sqrt[3]{150}\sqrt[3]{180}$

a. 90

d. 30

b. 11

e. 15

c. 60

___ 12. Simplify the expression. You may not use a calculator. Show all work.

$$\sqrt{72} + \sqrt{50}$$

a. $9\sqrt{2}$

b. $11\sqrt{2}$

c. $12\sqrt{5}$

d. $11\sqrt{5}$

e. $12\sqrt{2}$

___ 13. Simplify the expression.

$$\left(9x^8y^4\right)\left(\frac{1}{3}x^4y^6\right)$$

a. $3x^{32}y^{24}$

b. $27x^{12}y^{10}$

c. $3x^{24}y^{32}$

d. $3x^{12}y^{10}$

e. $3x^{10}y^{12}$

___ 14. Simplify the expression.

$$\frac{\left(x^9y^6\right)^2\left(x^2y^7\right)^{-4}}{x^8y^{12}}$$

a. $\frac{x^{28}}{y^2}$

b. $\frac{x^2}{y^{29}}$

c. $\frac{x^5}{y^{30}}$

d. $\frac{x^3}{y^{28}}$

e. $\frac{x^2}{y^{28}}$

___ 15. Simplify the expression. Assume the letters denote any real numbers.

$$\sqrt[3]{x^3y^6}$$

a. xy^2

b. x^2y

c. xy^5

d. xy^3

e. xy^4

___ 16. Simplify the expression. Assume the letters denote any real numbers.

$$\sqrt[7]{a^5b}\sqrt[7]{a^9b}$$

a. $a^2\sqrt[7]{b^2}$

b. $b^{17}\sqrt[7]{a^2}$

c. $a^{27}\sqrt[7]{b}$

d. $a^2\sqrt[7]{b^2}$

e. $a^7\sqrt[7]{b^2}$

___ 17. Simplify the expression.

$$(4b)^{\frac{1}{2}} \left(7b^{\frac{2}{3}} \right)$$

Assume that b is a positive number.

a. $14b^{\frac{6}{7}}$

b. $28b^{\frac{6}{7}}$

c. $11b^{\frac{7}{6}}$

d. $14b^{\frac{7}{6}}$

e. $28b^{\frac{7}{6}}$

___ 18. Write given number in scientific notation.

0.0000045783

a. 4.5783×10^{-6}

b. $4,578.3 \times 10^{-4}$

c. 45.783×10^{-7}

d. 4.5783×10^{-7}

e. 45.783×10^{-6}

___ 19. Use scientific notation, the Laws of Exponents, and a calculator to perform the operation.

$$\left(2.27 \times 10^{-15} \right) \left(3.89 \times 10^{-21} \right)$$

a. 8.8303×10^{-36}

b. 8.8303×10^{-35}

c. 8.8303×10^{-6}

d. 1.7137×10^6

e. 0.5835×10^{-36}

___ 20. Perform the indicated operations and simplify.

$$(t+6)(t+7) - 2(t+8)$$

a. $t^2 - 11t + 26$

b. $t^2 + 11t - 26$

c. $t^2 + 11t + 26$

d. $t^2 - 11t - 26$

e. $t^2 + 26t + 11$

___ 21. Perform the indicated operations and simplify.

$$(6-4y)^2$$

a. $36 - 48y + 16y^2$

b. $36 + 48y - 16y^2$

c. $36 - 24y + 16y^2$

d. $36 - 16y^2$

e. $36 + 16y^2$

___ 22. Perform the indicated operations and simplify.

$$\left(2x^8 + 4y^4 \right)^2$$

a. $4x^{16} + 16y^8$

b. $4x^{16} + 16x^8y^4 + 16y^8$

c. $4x^{16} - 16x^8y^4 + 16y^8$

d. $4x^{16} - 8x^8y^4 + 16y^8$

e. $4x^{16} + 8x^8y^4 + 16y^8$

- _____ 23. Perform the indicated operations and simplify.

$$(1 - 3y)^3$$

- a. $-27y^3 + 27y^2 - 9y + 1$ d. $27y^3 - 27y^2 + 9y - 1$
 b. $27y^3 - 32y^2 + 9y - 4$ e. $1 - 27y^3$
 c. $-27y^3 + 9y^2 - 27y + 1$

- _____ 24. Perform the indicated operations and simplify.

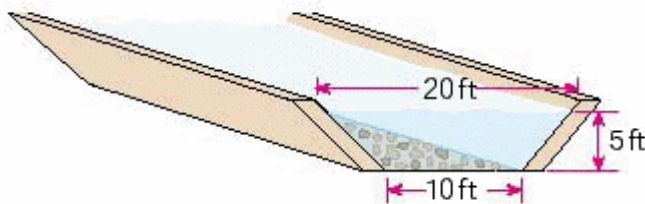
$$(z + x + t)(z - x - t)$$

- a. $z^2 + x^2 - 2zt + t^2$ d. $z^2 - x^2 - 2xt - t^2$
 b. $z^2 - x^2 + 2xt + t^2$ e. $z^2 - x^2 - 2xz - t^2$
 c. $z^2 + x^2 + 2xt + t^2$

- _____ 25. The speed of water flowing in a channel, such as a canal or river bed, is governed by the Manning Equation.

$$V = 1.486 \frac{A^{\frac{2}{3}} S^{\frac{1}{2}}}{p^{\frac{2}{3}} n}$$

Here V is the velocity of the flow in ft/s; A is the cross-sectional area of the channel in square feet; S is the downward slope of the channel; p is the wetted perimeter in feet (the distance from the top of one bank, down the side of the channel, across the bottom, and up to the top of the other bank); and n is the roughness coefficient (a measure of the roughness of the channel bottom). This equation is used to predict the capacity of flood channels to handle runoff from heavy rainfalls. For the canal shown in the figure, $A = 75 \text{ ft}^2$, $S = 0.055$, $p = 24.1 \text{ ft}$, and $n = 0.035$.



Find the speed with which water flows through the canal.

- a. $V = 20.101 \text{ ft/s}$ d. $V = 18.903 \text{ ft/s}$
 b. $V = 23.077 \text{ ft/s}$ e. $V = 23.406 \text{ ft/s}$
 c. $V = 21.224 \text{ ft/s}$

- _____ 26. Use a Factoring Formula to factor the expression.

$$36z^2 - 60z + 25$$

- a. $(6z + 5)^2$ d. $(5z - 4)(5z + 4)$
 b. $(5z - 4)^2$ e. $(6z - 5)^2$
 c. $(6z - 5)(6z + 5)$

- _____ 27. Factor the expression by grouping terms.

$$3x^2 + x^2 - 18x - 6$$

- a. $(x^2 - 6)(2x + 1)$ d. $(x^2 - 6)(3x + 1)$
 b. $(x^2 + 6)(2x - 1)$ e. $(x^2 - 7)(3x + 1)$
 c. $(x^2 - 7)(2x + 1)$

___ 28. Factor completely.

$$6x^6 + 24x^{10}$$

a. $x^6(1 + 4x^4)$

b. $6(x^6 + 4x^{10})$

c. $6x^6(1 + 4x^4)$

d. $6x^6(1 - 4x^4)$

e. $x^6(6 + 24x^4)$

___ 29. Factor the expression completely.

$$12x^2 - 7x - 12$$

a. $(7x + 5)(3x - 4)$

b. $(4x + 3)(5x - 7)$

c. $(7x + 5)(5x - 7)$

d. $(4x + 3)(3x - 4)$

e. $(4x - 3)(3x + 4)$

___ 30. Factor the expression completely.

$$r^2 - 10rs + 25s^2$$

a. $(r - 4s)(r + 4s)$

b. $(r + 4s)^2$

c. $(r - 5s)^2$

d. $(r - 4s)^2$

e. $(r - 5s)(r + 5s)$

___ 31. Find the domain of the expression.

$$-x^4 + x^3 + 7x$$

a. $\{x \mid x \neq 3\}$

b. $\{x \mid x \neq 7\}$

c. $\{x \mid x \neq 1\}$

d. all real numbers

e. $\{x \mid x \neq 5\}$

___ 32. An expression is given. Evaluate it at the given value.

$$-x^4 + x^3 + 8x, x = -1$$

a. -10

b. -9

c. 9

d. 10

e. -12

___ 33. Rationalize the denominator. You may not use a calculator. Show all work.

$$\frac{4}{\sqrt{3} + 6}$$

a. $\frac{24 - 6\sqrt{3}}{13}$

b. $\frac{24 + 4\sqrt{3}}{33}$

c. $\frac{24 + 4\sqrt{3}}{39}$

d. $\frac{24 - 4\sqrt{3}}{33}$

e. $\frac{24 + 6\sqrt{3}}{19}$

_____ 34. Rationalize the denominator. You may not use a calculator. Show all work.

$$\frac{1}{\sqrt{7} + \sqrt{3}}$$

a. $\frac{1(1 - \sqrt{3})}{4}$

b. $\frac{1(\sqrt{7} - \sqrt{3})}{10}$

c. $\frac{1(\sqrt{7} + \sqrt{3})}{10}$

d. $\frac{1(\sqrt{7} - \sqrt{3})}{4}$

e. $\frac{1(\sqrt{7} + \sqrt{3})}{4}$

_____ 35. Solve the equation.

$$\frac{z}{9} = \frac{6}{63}z + 7$$

a. -49

b. 7

c. 6

d. 63

e. 441

_____ 36. Solve the equation.

$$x - \frac{1}{12}x - \frac{1}{2}x - \frac{80}{24} = 0$$

a. 8

b. 6

c. -6

d. -8

e. 9

_____ 37. Solve the equation.

$$\frac{1}{x} = \frac{8}{5x} + 3$$

a. -8

b. $-\frac{1}{5}$

c. 5

d. $\frac{1}{3}$

e. $\frac{1}{5}$

_____ 38. Solve the equation $P = 8l + 5w$ for l .

a. $l = \frac{P - 5w}{8}$

b. $l = \frac{P + 8w}{5}$

c. $l = -\frac{P + 5w}{8}$

d. $l = \frac{P - 8w}{5}$

e. $l = \frac{P + 5w}{8}$

___ 39. Find all real solutions of the equation.

$$2x^2 + 7x - 4 = 0$$

a. none of these

b. $x = -\frac{1}{2}, x = 4$

c. $x = \frac{3}{2}, x = -1$

d. $x = \frac{1}{2}, x = -4$

e. $x = -\frac{1}{2}, x = -4$

___ 40. Find all real solutions of the equation.

$$\theta^2 - \frac{8}{7}\theta + \frac{16}{49} = 0$$

a. none of these

b. $\theta = \frac{4}{7}$

c. $\theta = \frac{4}{7}, \theta = -\frac{4}{7}$

d. $\theta = -\frac{8}{7}$

e. $\theta = \frac{4}{7}, \theta = -\frac{8}{7}$

___ 41. Use the discriminant to determine the number of real solutions of the equation.

$$x^2 - 5.46x + 3.8 = 0$$

Do not solve the equation.

a. two real solutions

b. exactly one real solution

c. more than two real solutions

d. none of these

e. no real solutions

___ 42. Find all real solutions of the equation.

$$\frac{x^2}{x+30} = 1$$

a. $x = 0, x = -1$

b. none of these

c. $x = 24, x = -20$

d. $x = 0, x = -5$

e. $x = 6, x = -5$

___ 43. Find all real solutions of the equation.

$$\sqrt{4x+16} + 4 = x$$

a. 4, 0

b. 0

c. -12

d. 0, 12

e. 12

___ 44. An executive in an engineering firm earns a monthly salary plus a Christmas bonus of \$9,000. If she earns a total of \$103,800 per year, what is her monthly salary?

a. \$8,650.00

b. \$9,050.00

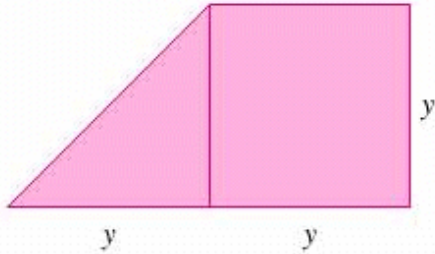
c. \$94,800.00

d. \$754.17

e. \$7,900.00

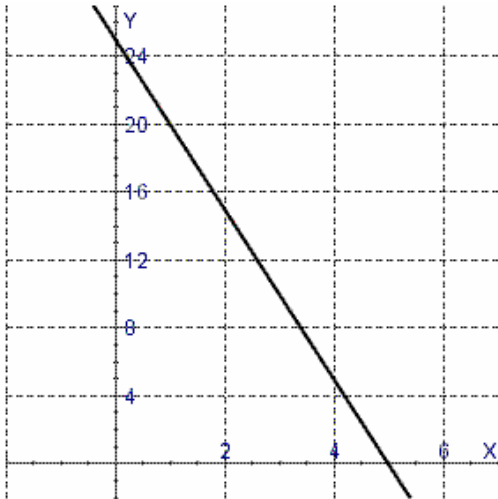
- ___ 45. A father is four times as old as his daughter. In 5 years, he will be three times as old as she is. How old is the daughter now?
- 15 years old
 - 4 years old
 - 10 years old
 - 5 years old
 - 6 years old

- ___ 46. Find the length y in the figure, if the shaded area is 96 in^2 .



- 8 in.
 - 9.80 in.
 - 48.00 in.
 - 11.31 in.
 - 9 in.
- ___ 47. What quantity of a 50% acid solution must be mixed with a 20% solution to produce 150 mL of a 40% solution?
- 120 mL
 - 100 mL
 - 50 mL
 - 60 mL
 - 90 mL
- ___ 48. Find the slope of the line through $P(-1, -4)$ and $Q(-5, 4)$.
- $m = -1$
 - $m = 4$
 - $m = -2$
 - $m = -7$
 - $m = 1$
- ___ 49. Determine the correct equation for the line passing through the point $(3, 15)$ with a slope of 3.
- $y = -3x + 6$
 - $y = 3x + 15$
 - $y = -3x - 15$
 - $y = 3x - 6$
 - $y = 3x + 6$

___ 50. Determine the slope of the line which is sketched below.



- a. $m = -5$
- b. $m = 1$
- c. $m = -4$
- d. $m = -10$
- e. $m = -2$

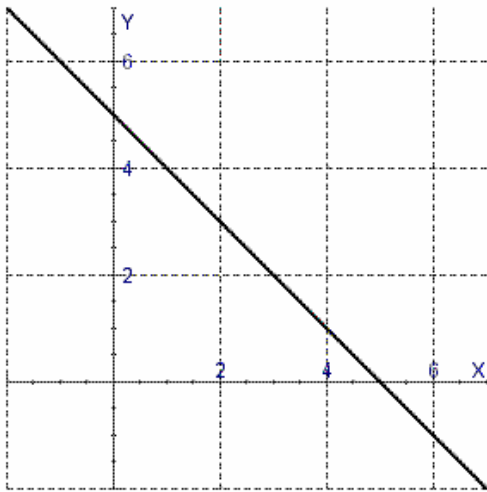
___ 51. Determine the correct equation for the line passing through the point $(5, -4)$ and parallel to the line $x + 5y = 5$.

- a. $y = 5x - 3$
- b. $y = -\frac{1}{5}x - 5$
- c. $y = 5x + 3$
- d. $y = \frac{1}{5}x + 3$
- e. $y = -\frac{1}{5}x - 3$

___ 52. Write the equation for the line passing through the point $(1, 20)$ which is perpendicular to the line $y = 19$.

- a. $x = 0$
- b. $y = -1$
- c. $y = 3$
- d. $x = 1$
- e. $y = 2$

53. Determine the correct equation for the line whose graph is sketched below.



- a. $y = 1x + 5$
- b. $y = -1x - 5$
- c. $y = -1x + 5$
- d. $y = 1x - 5$
- e. $y = \frac{1}{1}x + 5$

54. Determine the correct equation for the line passing through the point (1, 4) which is parallel to the line passing through both of the points (5, 3) and (-3, 75).

- a. $y = -9x - 13$
- b. $y = 9x + \frac{1}{13}$
- c. $y = -9x + 13$
- d. $y = -9x + \frac{1}{13}$
- e. $y = -9x - \frac{1}{13}$

55. The relationship between the Fahrenheit (F) and Celsius (C) temperature scales is given by the equation:

$$F = \frac{9}{5}C + 32.$$

Find the Celsius temperature corresponding to $F = 95^\circ$.

- a. $C = 36^\circ$
- b. $C = 37^\circ$
- c. $C = 34^\circ$
- d. $C = 35^\circ$
- e. $C = 33^\circ$

56. A large pond is stocked with fish. The fish population P is modeled by the formula $P = 2t + 7\sqrt{t} + 269$, where t is the number of days since the fish were first introduced into the pond. How many days will it take for the fish population to reach 416?

- a. 49 days
- b. 98 days
- c. 50 days
- d. 42 days
- e. 7 days

57. Solve the equation.
 $(t-5)^2 = (t+5)^2 + 160$
- 5
 - 5
 - 8
 - 8
 - 32

58. Solve the equation.
 $\sqrt{3x} + \sqrt{27} = \frac{2x+7}{\sqrt{3}}$
- 2
 - 27
 - 2
 - 27
 - 9

59. Find all real solutions of the equation.
 $x^2 - \sqrt{61}x + 3 = 0$
- $x = \frac{\sqrt{61}-7}{2}, x = -\frac{\sqrt{61}+7}{2}$
 - $x = -\frac{\sqrt{61}-7}{2}, x = -\frac{\sqrt{61}+7}{2}$
 - $x = \frac{\sqrt{61}-7}{2}, x = \frac{\sqrt{61}+7}{2}$
 - None of these
 - $x = -\frac{\sqrt{61}-7}{2}, x = \frac{\sqrt{61}+7}{2}$

60. Find all real solutions of the equation.
 $\sqrt{\sqrt{x+2} + x} = 2$
- $x = 6$
 - $x = -7, x = 2$
 - $x = 7, x = 2$
 - $x = -14, x = -5$
 - $x = 2$

61. Find all real solutions of the equation.
 $x - 5\sqrt{x} + 4 = 0$
- $x = -1, x = -16$
 - none of these
 - $x = -1, x = 16$
 - $x = 1, x = -16$
 - $x = 1, x = 16$

_____ 62. If $\frac{a}{b} = \frac{c}{d}$, then _____.

a. $\frac{a+b}{b} = \frac{c+b}{d}$

b. $ac = bd$

c. $\frac{a+b}{b} = \frac{c+d}{d}$

d. $\frac{a}{b} = \frac{a+c}{b+d}$

_____ 63. Which of the following sets of numbers is a Pythagorean triple?

a. $\sqrt{3}, \sqrt{4}, \sqrt{5}$

b. 12, 16, 20

c. $\frac{1}{3}, \frac{1}{4}, \frac{1}{5}$

d. $3^2, 4^2, 5^2$

_____ 64. Which of the following is NOT enough information to solve a right triangle?

a. Two sides

b. One side length and one trigonometric ratio

c. Two angles

d. One side length and one acute angle measure

_____ 65. Simplify the expression.

$$\left(11a^{19}b^6c^5\right)\left(\frac{2a^3b^2}{c^2}\right)^{-5}$$

a. $\frac{11a^4c^{16}}{32b^4}$

b. $\frac{11b^4c^{15}}{32a^4}$

c. $\frac{11a^4c^{15}}{32b^4}$

d. $\frac{11a^3c^{15}}{32b^5}$

e. $\frac{11a^5c^{14}}{32b^4}$

_____ 66. Simplify the expression.

$$x^{\frac{1}{3}} x^{\frac{1}{7}}$$

Assume that x is a positive number.

a. $\frac{1}{x^{21}}$

b. $\frac{21}{x^{10}}$

c. $\frac{1}{x^{10}}$

d. $\frac{10}{x^{21}}$

e. $\frac{10}{2x^{21}}$

67. Simplify the expression.

$$\left(\frac{a^2b^{-3}}{x^{-3}y^2}\right)^3 \left(\frac{x^{-4}b^{-2}}{a^{\frac{3}{2}}y^{\frac{1}{3}}}\right)$$

Eliminate any negative exponents. Assume that all variables are positive numbers.

a. $\frac{b^{\frac{9}{2}}y^5}{a^{11}x^{\frac{19}{3}}}$

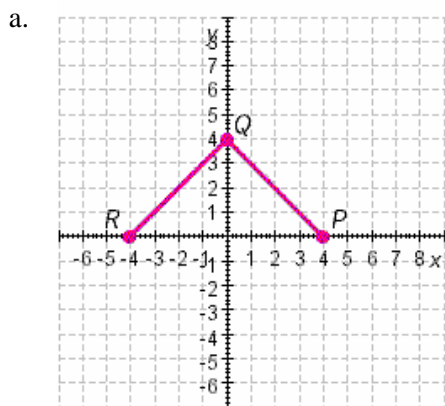
b. $\frac{b^{\frac{9}{2}}x^5}{a^{11}y^{\frac{19}{3}}}$

c. $\frac{a^{\frac{9}{2}}x^5}{b^{11}y^{\frac{19}{3}}}$

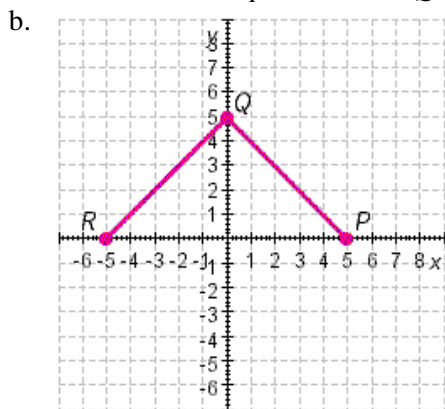
d. $\frac{a^{\frac{9}{2}}y^5}{b^{11}x^{\frac{19}{3}}}$

e. $\frac{a^9x^5}{b^{11}y^{\frac{19}{2}}}$

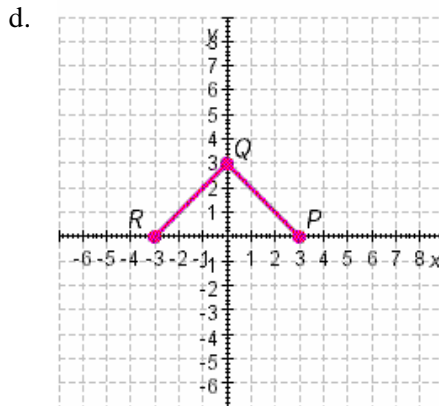
68. Plot the points $P(3,0)$, $Q(0,3)$, and $R(-3,0)$, on a coordinate plane. Where must the point S be located so that the quadrilateral $PQRS$ is a square? Find the area of this square.



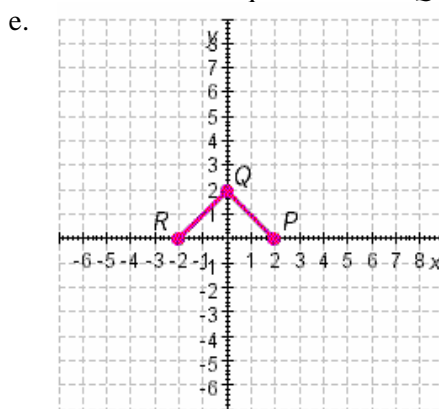
The point S must be located at $(1, -3)$.
The area of the quadrilateral $PQRS$ is 21.



The point S must be located at $(0, -3)$.
The area of the quadrilateral $PQRS$ is 12.

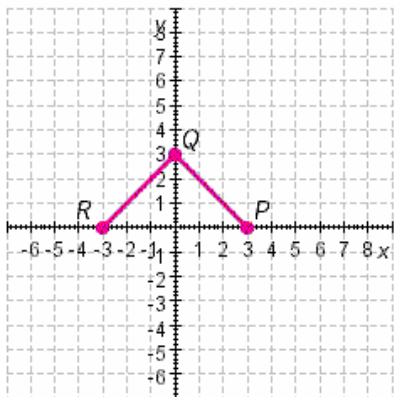


The point S must be located at $(0, -3)$.
The area of the quadrilateral $PQRS$ is 18.



The point S must be located at $(0, -3)$.
The area of the quadrilateral $PQRS$ is 9.

c.

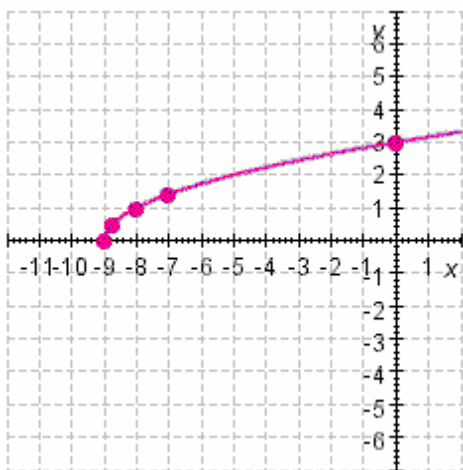


The point S must be located at $(1, -3)$.
The area of the quadrilateral $PQRS$ is 15.

69. Make a table of values and sketch the graph of the equation. Find the x - and y -intercepts.

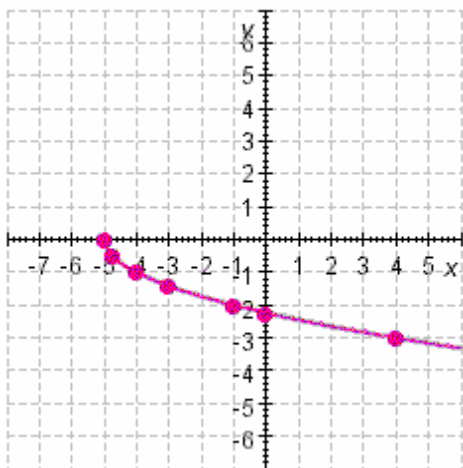
$$y = \sqrt{x+9}$$

a.



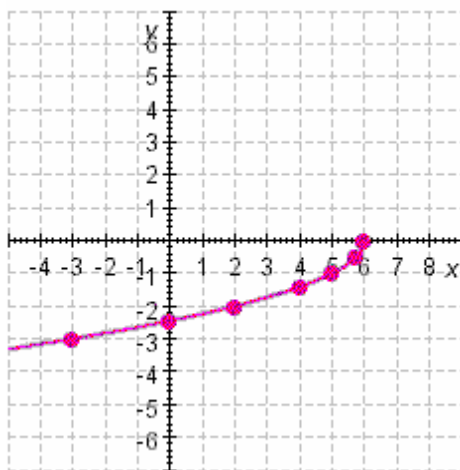
x -intercept is -9 , y -intercept is 3

b.



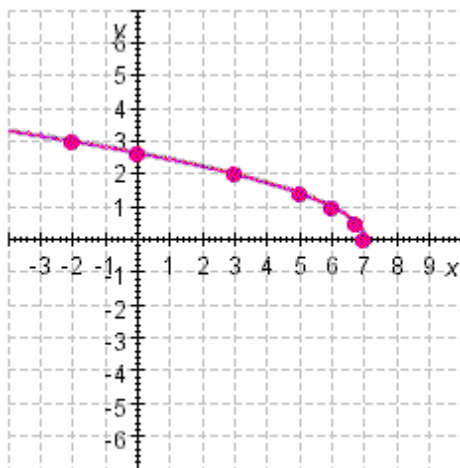
x -intercept is -5 , y -intercept is -3

d.



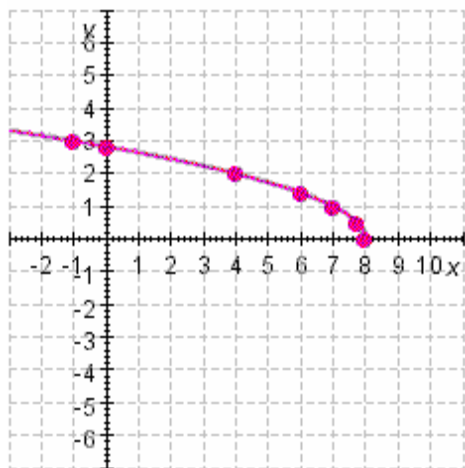
x -intercept is 6 , y -intercept is -3

e.



x -intercept is 7 , y -intercept is 3

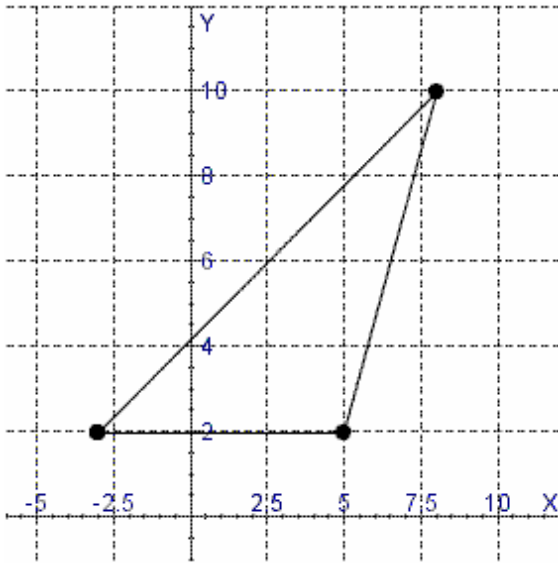
c.



x -intercept is 8, y -intercept is 3

- ___ 70. Find the distance between the points $(3, 10)$ and $(8, 22)$.
- 5
 - 13
 - 144
 - 169
 - 12
- ___ 71. Find the midpoint of the segment joining the points $(7, -4)$ and $(9, 4)$.
- $(0, 8)$
 - $(2, -8)$
 - $(8, 0)$
 - $(-8, 0)$
 - $(0, 2)$
- ___ 72. A rectangle has the vertices of $A(5, 5)$, $B(8, 5)$, $C(5, -1)$, and $D(8, -1)$ on a coordinate plane. Find the area of the rectangle.
- 17
 - 14
 - 19
 - 22
 - 18

73. Find the area of the triangle shown in the figure. Round to the closest positive whole number.



- a. 30
- b. 34
- c. 35
- d. 32
- e. 29

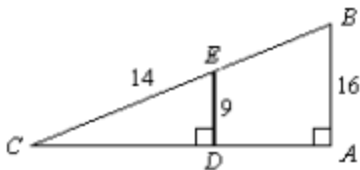
74. Find a point on the y-axis that is equidistant from the points $(1, -7)$ and $(5, -1)$.

- a. $(-2, 0)$
- b. $(0, -2)$
- c. $(0, 0)$
- d. $(0, 3)$
- e. $(0, -4)$

75. A worker in an assembly line takes 5 hours to produce 26 parts. At that rate, how many parts can she produce in 20 hours?

- a. 520 parts
- b. 6 parts
- c. 104 parts
- d. 208 parts

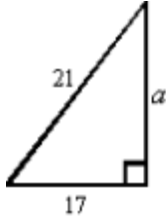
76. Given that $\frac{ED}{BA} = \frac{EC}{BC}$, find BC to the nearest tenth. The figure is not drawn to scale.



- a. 27.1
- b. 3.1
- c. 24.9
- d. 10.9

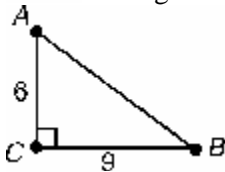
81. Karen wants to measure the height of the streetlight outside her house. She places a mirror on the ground 52 feet from the streetlight, then walks backward until she is able to see the top of the streetlight in the mirror. Her eyes are 5.8 feet above the ground, and she is 14 feet from the mirror. What is the height of the streetlight to the nearest tenth of a foot?
- 21.5
 - 20.1
 - 14.9
 - 125.5

82. Find the length of the leg of this right triangle. Give an approximation to 3 decimal places.

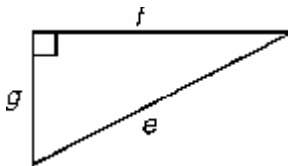


- 12.329
 - 11.916
 - 12.650
 - 27.019
83. How long is a string reaching from the top of a 13-ft pole to a point on the ground that is 7 ft from the base of the pole?
- $\sqrt{120}$ ft
 - $\sqrt{208}$ ft
 - $\sqrt{218}$ ft
 - $\sqrt{110}$ ft

84. $\triangle ABC$ is a right triangle. $AB =$ _____.



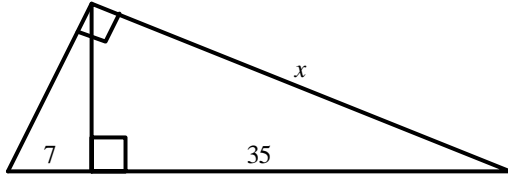
- $3\sqrt{13}$
 - $3\sqrt{6}$
 - $3\sqrt{5}$
 - 117
85. For the triangle shown below, the Pythagorean Theorem states that _____.



- $e^2 + f^2 = g^2$
- $e = f + g$
- $f^2 - g^2 = e^2$
- $e^2 = f^2 + g^2$

86. A scuba diver has a taut rope connecting the dive boat to an anchor on the ocean floor. The rope is 110 feet long. The water is 55 feet deep. To the nearest tenth of a foot, how far is the anchor from a point directly below the boat?
- 95.3 ft
 - 123.0 ft
 - 81.4 ft
 - 89.8 ft

87. Find the value of x .

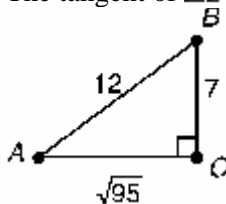


- $7\sqrt{5}$
 - $\sqrt{77}$
 - $7\sqrt{30}$
 - $7\sqrt{6}$
88. In a 45° - 45° - 90° triangle, the ratio of the length of the hypotenuse to the length of a side is _____.
- 1:1
 - $\sqrt{3}:1$
 - $\sqrt{2}:1$
 - 2:1

89. An equilateral triangle has side lengths of 10. The length of its altitude is _____.
- $10\sqrt{5}$
 - 5
 - $5\sqrt{10}$
 - $5\sqrt{3}$

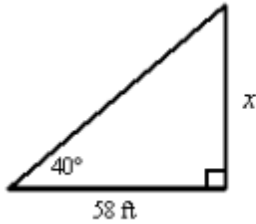
90. In a 30° - 60° - 90° triangle, the ratio of the length of the hypotenuse to the length of the shorter side is _____.
- $2:\sqrt{3}$
 - $\sqrt{2}:1$
 - 2:1
 - $\sqrt{3}:1$

91. The tangent of $\angle B$ is _____.



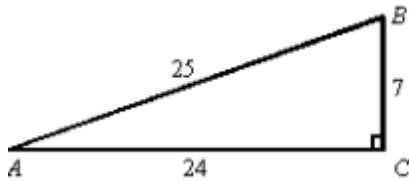
- $\frac{\sqrt{95}}{7}$
- $\frac{\sqrt{95}}{12}$
- $7\sqrt{95}$
- $\frac{12}{7}$

- ___ 92. A photographer shines a camera light at a particular painting forming an angle of 40° with the camera platform. If the light is 58 feet from the wall where the painting hangs, how high above the platform is the painting?



- a. 1.19 ft b. 48.67 ft c. 69.12 ft d. 0.84 ft

- ___ 93. Write $\cos B$.

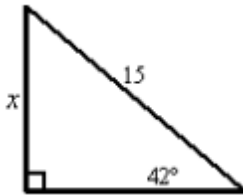


- a. $\frac{24}{25}$ b. $\frac{7}{25}$ c. $\frac{7}{24}$ d. $\frac{24}{7}$

- ___ 94. To find the height of a tower, a surveyor positions a transit that is 2 meters tall at a spot 95 meters from the base of the tower. She measures the angle of elevation to the top of the tower to be 32° . What is the height of the tower, to the nearest meter?

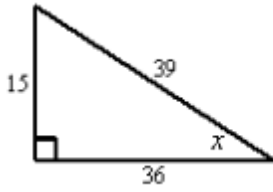
- a. 154 m
b. 59 m
c. 61 m
d. 152 m

- ___ 95. What is x to the nearest hundredth? (not drawn to scale)



- a. $x = 16.66$ b. $x = 13.51$ c. $x = 11.15$ d. $x = 10.04$

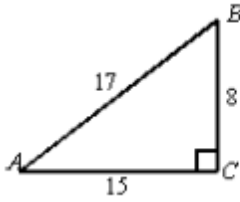
___ 96. Use the diagram to find $\cos x$ as a fraction in simplest form.



- a. $\frac{12}{13}$
- b. $2\frac{2}{5}$

- c. $\frac{5}{12}$
- d. $\frac{5}{13}$

___ 97. Find $\tan B$ for the right triangle below:



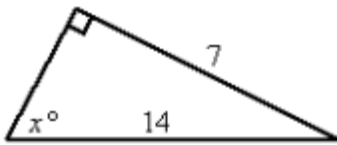
- a. $\frac{8}{17}$

- b. $\frac{15}{17}$

- c. $\frac{8}{15}$

- d. $\frac{15}{8}$

___ 98. Solve for x to the nearest degree.



- a. 30

- b. 63

- c. 60

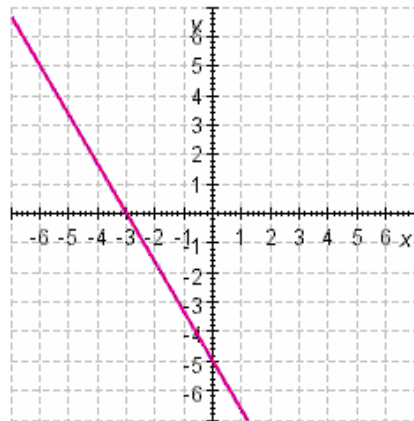
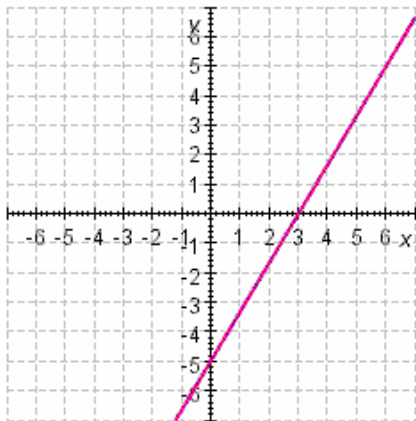
- d. 27

___ 99. Find the slope and y-intercept of the line and draw its graph.

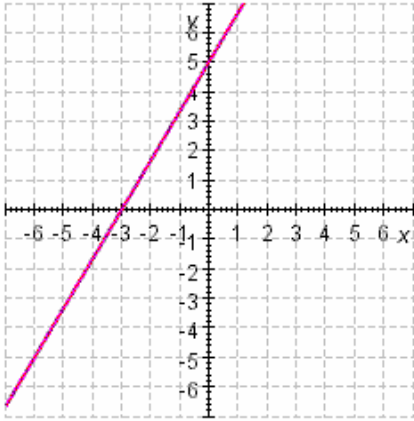
$$\frac{1}{3}x - \frac{1}{5}y + 1 = 0$$

- a. The slope is $\frac{5}{3}$, and the y-intercept is -5 .

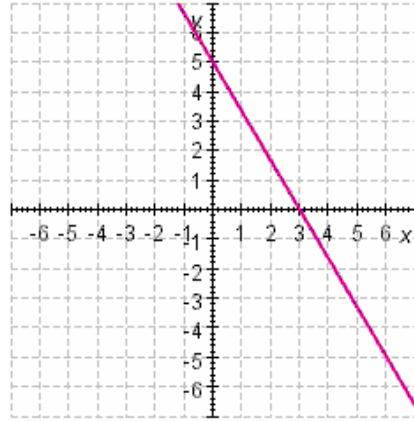
- d. The slope is $-\frac{5}{3}$, and the y-intercept is -5 .



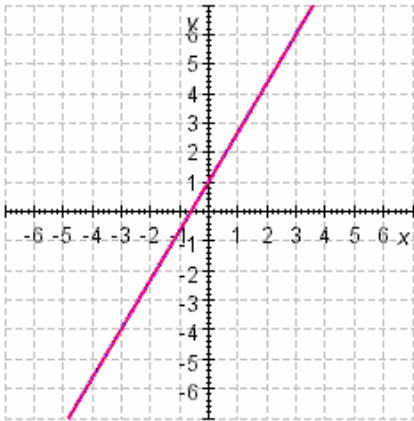
b. The slope is $\frac{5}{3}$, and the y-intercept is 5.



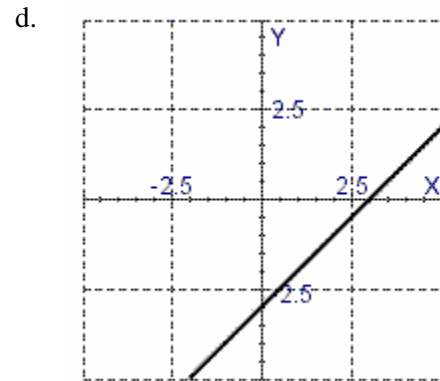
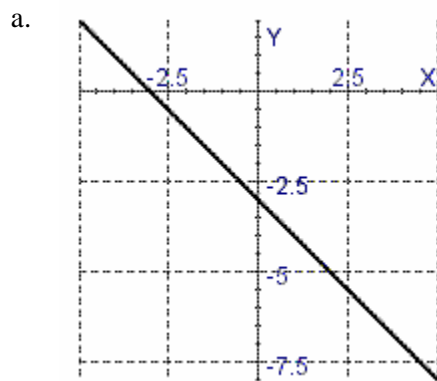
e. The slope is $-\frac{5}{3}$, and the y-intercept is 5.



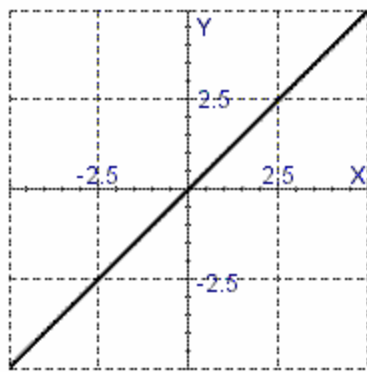
c. The slope is $\frac{5}{3}$, and the y-intercept is 5.



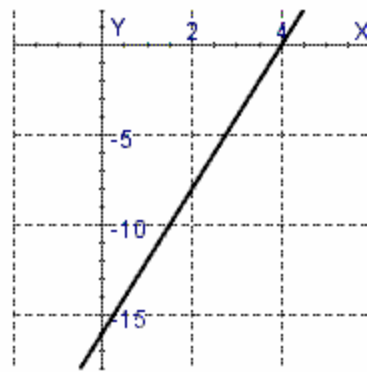
___ 100. Determine the correct sketch of the line through (2, -8) with a slope of 4.



b.



e.



c.

