

MATH 090 PRACTICE PROBLEMS FOR EXAM #1

(for practice only)

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

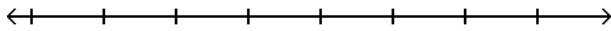
Write the solution set using interval notation.

1) $\frac{-6x - 8}{2} < -28$

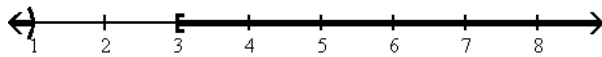
Answer: $(8, \infty)$

Solve the compound inequality. Graph the solution set.

2) $6x - 4 < 2x$ or $-3x \leq -9$

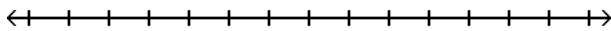


Answer: $(-\infty, 1) \cup [3, \infty)$

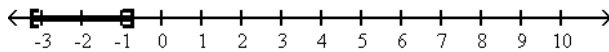


Solve the inequality. Graph the solution set.

3) $|4k + 8| \leq 5$



Answer: $[-\frac{13}{4}, -\frac{3}{4}]$



Solve the formula for the specified variable.

4) $S = 2\pi rh + 2\pi r^2$ for h

Answer: $h = \frac{S - 2\pi r^2}{2\pi r}$

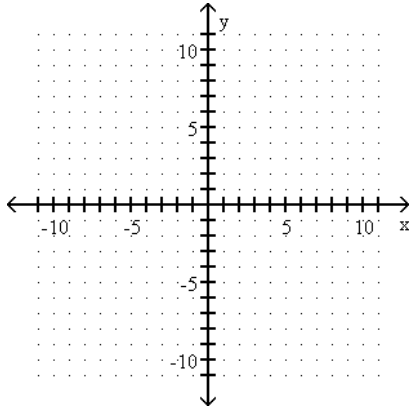
Solve.

- 5) You are varnishing the background for a rectangular mural. The base of the mural is $6\frac{1}{2}$ meters and the height of the mural is 3 meters. How many cans of varnish will you need if each can covers 10 square meters?

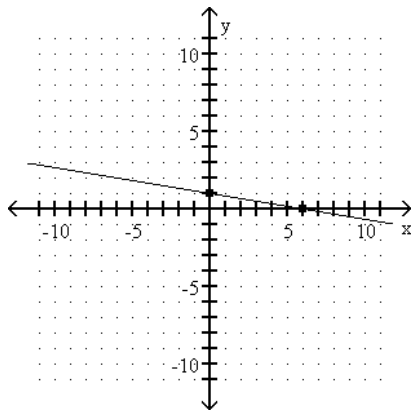
Answer: 2 cans of varnish

Graph the function by finding x- and y-intercepts.

6) $3x + 18y = 18$

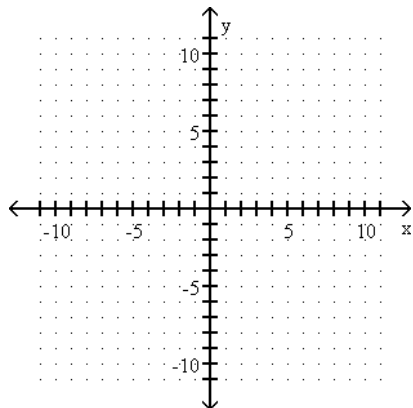


Answer:

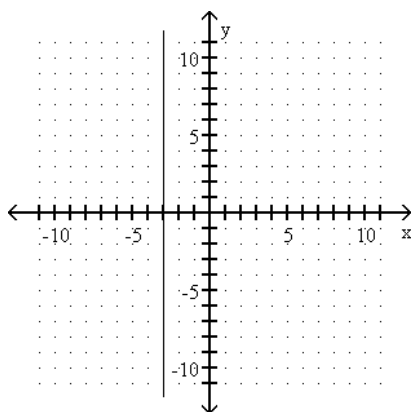


Graph the equation.

7) $x = -3$



Answer:



Find the slope of the line that goes through the given points.

8) $(6, -7), (-3, 9)$

Answer: $-\frac{16}{9}$

Find the slope of the line.

9) $-2y + 3x = 10$

Answer: $\frac{3}{2}$

10) $x + 2 = 0$

Answer: undefined

11) $y = 2$

Answer: 0

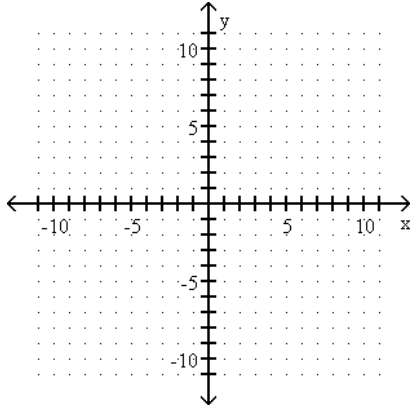
Determine whether the lines are parallel, perpendicular, or neither.

$$\begin{aligned} 12) \quad &9x - 81y = 2 \\ &-9x - y = 8 \end{aligned}$$

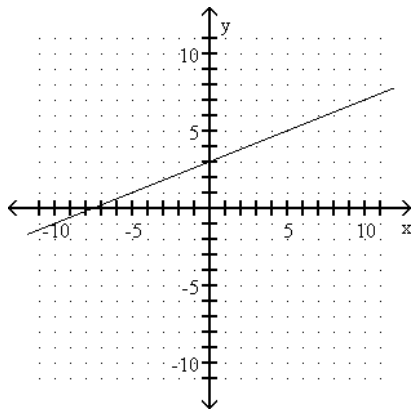
Answer: perpendicular

Graph the equation.

$$13) \quad y = \frac{2}{5}x + 3$$



Answer:



Find an equation of the line. Write the equation in standard form.

$$14) \quad \text{Slope } -\frac{7}{9}; \text{ through } (4, 3)$$

$$\text{Answer: } 7x + 9y = 55$$

$$15) \quad \text{Undefined slope; through } (-7, -9)$$

$$\text{Answer: } x = -7$$

Find an equation of the line. Write the equation using function notation.

$$16) \quad \text{Through } (-4, -1); \text{ perpendicular to } f(x) = 2x - 4$$

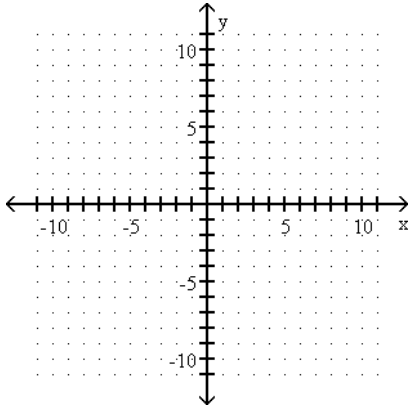
$$\text{Answer: } f(x) = -\frac{1}{2}x - 3$$

17) Through (9, 1); parallel to $5x + 9y = -27$

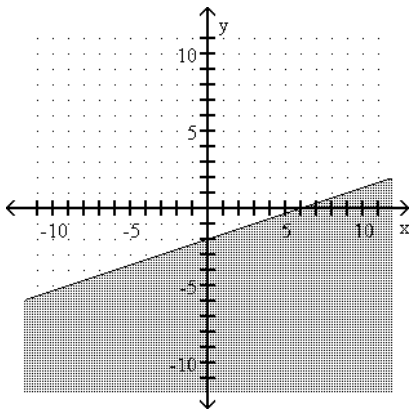
Answer: $f(x) = -\frac{5}{9}x + 6$

Graph the inequality.

18) $2x - 6y \geq 12$



Answer:



Solve the system of equations by the elimination method.

19)

$$\begin{cases} 3x - 7y = -37 \\ 5x + 3y = -3 \end{cases}$$

Answer: $(-3, 4)$

20)

$$\begin{cases} -x - 2y = -4 \\ 5x + 10y = 8 \end{cases}$$

Answer: \emptyset

21)

$$\begin{cases} 7x + y = 3 \\ 2y = 6 - 14x \end{cases}$$

Answer: $\{(x, y) \mid 7x + y = 3\}$

Solve the system.

22)

$$\begin{cases} x + y + z = -1 \\ x - y + 3z = 1 \\ 5x + y + z = 15 \end{cases}$$

Answer: (4, -3, -2)

23)

$$\begin{cases} 4x + y - \frac{3}{2}z = -17 \\ \frac{1}{2}x - 3z = -13 \\ x + 4y = -14 \end{cases}$$

Answer: (-2, -3, 4)

Solve.

24) A chemist needs 150 milliliters of a 55% solution but has only 51% and 66% solutions available. Find how many milliliters of each that should be mixed to get the desired solution.

Answer: 110 ml of 51%; 40 ml of 66%

Simplify. Write the answer with positive exponents.

25) $(5x^{-7}y^9z^{-9})^{-3}$

Answer: $\frac{x^{21}z^{27}}{125y^{27}}$

26) $\left(\frac{-4x^5y^{-3}}{3z^7}\right)^{-2}$

Answer: $\frac{9y^6z^{14}}{16x^{10}}$

Perform the indicated operations.

27) $(4y^2 + 9) - (-13y^4 - 2y^2 + 9)$

Answer: $13y^4 + 6y^2$

Multiply.

28) $11ax^3(-9ax^5 - 7x^4 + 10a)$

Answer: $-99a^2x^8 - 77ax^7 + 110a^2x^3$