

**Solve the equation. Then tell whether the equation is a conditional equation, an identity, or a contradiction.**

- 1)  $2x - (6 - x) + 3x + 6 = 6x + 2$  1) \_\_\_\_\_  
 A)  $(-\infty, \infty)$ ; identity B)  $\{2\}$ ; conditional equation  
 C)  $\{14\}$ ; conditional equation D)  $\emptyset$ ; contradiction

**Solve.**

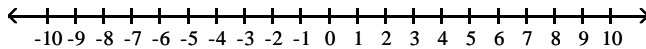
- 2)  $-7y^2 + wy - x = 0$  for  $w$  2) \_\_\_\_\_  
 A)  $w = \frac{x - 7y^2}{y}$  B)  $w = -\frac{x + 7y^2}{y}$  C)  $w = \frac{7y^2 + y}{x}$  D)  $w = \frac{x + 7y^2}{y}$

**Solve the problem.**

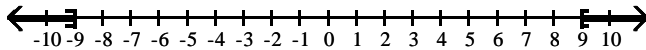
- 3) A plane climbs from an altitude of 11,000 ft to a cruising altitude of 33,000 ft. The plane ascends at a rate of 2750 ft/min. How long will it take to reach cruising altitude? 3) \_\_\_\_\_  
 A) 8 min B) 16 min C) 0.1 min D) 60,500,000 min
- 4) Allied Plumbing spent \$33,990 this year on health insurance alone. If total sales were \$485,300, what percent of total sales was spent on health insurance? Round to the nearest tenth of a percent, if necessary. 4) \_\_\_\_\_  
 A) 14.3% B) 143% C) 7% D) 0.7%
- 5) Jill is 9 kilometers away from Joe. Both begin to walk toward each other at the same time. Jill walks at 2.5 km/hr. They meet in 2 hours. How fast is Joe walking? 5) \_\_\_\_\_  
 A) 2.25 km/hr B) 4 km/hr C) 2 km/hr D) 7 km/hr

**Solve the inequality. Give the solution set in both interval and graph forms.**

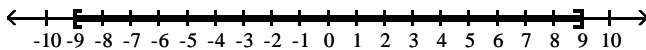
- 6)  $-13 \leq \frac{4}{3}x - 1 \leq 11$  6) \_\_\_\_\_



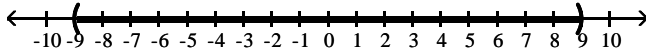
- A)  $(-\infty, -9] \cup [9, \infty)$



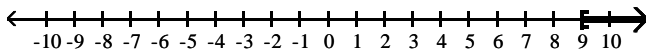
- B)  $[-9, 9]$



- C)  $(-9, 9)$



- D)  $[9, \infty)$



**Answer the question.**

- 7) How is the graph of a line with undefined slope situated in a rectangular coordinate system? 7) \_\_\_\_\_  
 A) It is not a line. B) It is a horizontal line.  
 C) It is an oblique line. D) It is a vertical line.

**Decide whether the pair of lines is parallel, perpendicular, or neither.**

- 8)  $2x + 3y = 18$  and  $2y = 3x + 6$  8) \_\_\_\_\_  
 A) Parallel B) Perpendicular C) Neither

9)  $4x + y = -1$  and  $3y = 9x - 13$

A) Parallel

B) Perpendicular

C) Neither

9) \_\_\_\_\_

**Solve the problem.**

10) In 1980, there were 108,000 farms in a state. As of 2005, there were 86,000. Find the average rate of change in the number of farms per year.

A) 7760 farms per yr

B) 880 farms per yr

C) -880 farms per yr

D) -4880 farms per yr

10) \_\_\_\_\_

**Find an equation of the line, and write it in (a) slope-intercept form if possible and (b) standard form.**

11) Through  $(-9, -10)$ ; horizontal

A) (a)  $y = 9$

B) (a) not possible

C) (a) not possible

D) (a)  $y = -10$

(b)  $y = 9$

(b)  $x = 10$

(b)  $x = -9$

(b)  $y = -10$

11) \_\_\_\_\_

12) Through  $(-6, 0)$  and  $(1, 5)$

A) (a)  $y = -\frac{5}{7}x + \frac{30}{7}$

B) (a)  $y = -\frac{3}{2}x + \frac{7}{2}$

(b)  $-5x - 7y = -30$

(b)  $-6x - 4y = -14$

C) (a)  $y = \frac{5}{7}x + \frac{30}{7}$

D) (a)  $y = \frac{3}{2}x + \frac{7}{2}$

(b)  $5x - 7y = -30$

(b)  $6x - 4y = -14$

12) \_\_\_\_\_

13) Through  $(3, -4)$ ; vertical

A) (a)  $y = -4$

B) (a) not possible

C) (a) not possible

D) (a)  $y = 3$

(b)  $y = -4$

(b)  $x = 3$

(b)  $x = -4$

(b)  $y = 3$

13) \_\_\_\_\_

14) Through  $(-3, -7)$  and perpendicular to  $y = \frac{1}{3}x + 13$

A) (a)  $y = -\frac{1}{3}x - 8$

B) (a)  $y = \frac{1}{3}x - 6$

C) (a)  $y = 3x - 16$

D) (a)  $y = -3x - 16$

(b)  $x + 3y = -24$

(b)  $x - 3y = 18$

(b)  $3x - y = -16$

(b)  $3x + y = -16$

14) \_\_\_\_\_

**Solve the problem.**

15) Find  $f(a)$  when  $f(x) = -x^2 + 2x + 5$ .

A)  $-a^2 + 2a + 5$

B)  $-a^2 + 2a$

C)  $-3a$

D)  $a^2 + 2a + 5$

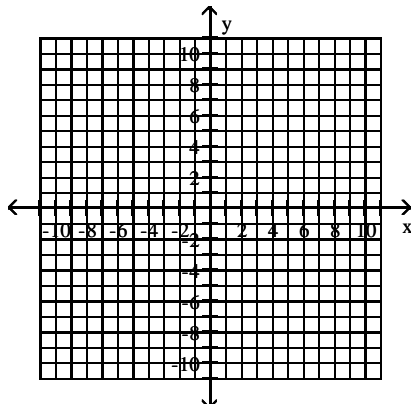
15) \_\_\_\_\_

**Use a graph to solve the system.**

16)  $x - y = 2$

$x + y = 16$

16) \_\_\_\_\_



A)  $\{(14, 18)\}$

B)  $\{(18, 14)\}$

C)  $\{(9, 7)\}$

D)  $\{(7, 9)\}$

Solve the system by substitution or elimination. If a system is inconsistent or has dependent equations, say so.

17)  $x - 3y = 2$  17) \_\_\_\_\_

$x = 6 + 3y$

A)  $\{(2, 0)\}$

B)  $\{(2, 3)\}$

C)  $\{(x, y) \mid x - 3y = 2\}$ ; dependent equations

D)  $\emptyset$ ; inconsistent system

18)  $x + 6y = -31$  18) \_\_\_\_\_

$7x + 5y = -32$

A)  $\{(-2, -4)\}$

B)  $\{(-1, -5)\}$

C)  $\{(1, -4)\}$

D)  $\emptyset$ ; inconsistent system

Evaluate the expression.

19)  $-7^2$  19) \_\_\_\_\_

A)  $-49$

B)  $-\frac{1}{49}$

C)  $\frac{1}{49}$

D)  $49$

20)  $8^{-1} - 4^{-1}$  20) \_\_\_\_\_

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

B)  $-\frac{1}{8}$

C)  $-\frac{1}{4}$

D)  $-8$

21)  $\frac{3^{-1}}{4^{-1}}$  21) \_\_\_\_\_

A)  $\frac{3}{4}$

B)  $-\frac{4}{3}$

C)  $\frac{4}{3}$

D)  $1$

22)  $(-5)^{-2}$  22) \_\_\_\_\_

A)  $\frac{1}{25}$

B)  $-25$

C)  $25$

D)  $-\frac{1}{25}$

Simplify. Write the answer with only positive exponents. Assume that all variables represent nonzero real numbers.

23)  $\frac{(8x^5y^3)^{-1}}{(3x^3y^3)^3}$  23) \_\_\_\_\_

A)  $\frac{1}{216x^{14}y^{12}}$

B)  $\frac{8}{27x^{14}y^{12}}$

C)  $216x^{14}y^{12}$

D)  $\frac{1}{216x^4y^6}$

24)  $(2x^4y^5)^2(2y^5)^3$  24) \_\_\_\_\_

A)  $32x^6y^{15}$

B)  $32x^8y^{25}$

C)  $4x^8y^{25}$

D)  $4x^4y^{10}$

Write the number in standard form.

25)  $4.97 \times 10^{-4}$  25) \_\_\_\_\_

A)  $0.0000497$

B)  $-497,000$

C)  $0.000497$

D)  $0.00497$

Use scientific notation to simplify. Write the answer in both scientific notation and standard notation.

26)  $\frac{360,000 \times 0.0004}{0.006 \times 6,000,000}$  26) \_\_\_\_\_

A)  $4 \times 10^{-1}$ ;  $0.4$

B)  $4 \times 10^{-2}$ ;  $0.04$

C)  $4 \times 10^{-3}$ ;  $0.004$

D)  $0.4 \times 10^{-2}$ ;  $0.04$

For the polynomial function, find the requested value.

27)  $f(x) = 3x + 3$ ;  $f(5)$  27) \_\_\_\_\_

A)  $12$

B)  $6$

C)  $18$

D)  $30$

For the given pair of functions, find the requested function.

- 28)  $f(x) = 4x^2 + 7x + 8$  and  $g(x) = 2x^2 + 3x - 4$ ;  $(f - g)(x)$  28) \_\_\_\_\_  
 A)  $2x^4 + 4x^2 + 12$       B)  $2x^2 - 4x - 12$       C)  $2x^2 + 4x + 12$       D)  $2x^2 + 4x + 4$

Perform the indicated operations.

- 29)  $(7k^3 + 4k^2 - k + 2) - (3k^3 - 4k^2 - k - 1) + (2k^3 + 4k^2 - k + 1)$  29) \_\_\_\_\_  
 A)  $12k^3 + 12k^2 - k + 4$       B)  $6k^3 - 12k^2 + k + 3$   
 C)  $6k^3 + 12k^2 + k + 4$       D)  $6k^3 + 12k^2 - k + 4$

- 30)  $[3r + (s + 4)][3r - (s + 4)]$  30) \_\_\_\_\_  
 A)  $9r^2 + s^2 - 8s - 16$       B)  $9r^2 - s^2 - 4s - 16$   
 C)  $9r^2 - s^2 - 9s - 16$       D)  $9r^2 - s^2 - 8s - 16$

- 31)  $\frac{21x^3 + 56x^2 + 56x + 4}{7x}$  31) \_\_\_\_\_  
 A)  $3x^3 + 8x^2 + 8x + \frac{4}{7}$       B)  $3x^2 + 56x + 56 + \frac{4}{x}$   
 C)  $3x^2 + 8x + 8 + \frac{4}{x}$       D)  $3x^2 + 8x + 8 + \frac{4}{7x}$

- 32)  $(2x^3 - 5x^2 - 5x - 22) \div (x - 4)$  32) \_\_\_\_\_  
 A)  $2x^2 + 3x + 7 + \frac{6}{x - 4}$       B)  $2x^3 + 3x + \frac{6}{x - 4}$   
 C)  $2x^2 - x + 9 + \frac{5}{x - 4}$       D)  $2x^2 + 3x + 7$

Factor.

- 33)  $10x^2y^5 - 5x^2y^3 - 15x^4y^3$  33) \_\_\_\_\_  
 A)  $5x^2y^3(5y^2 - xy - 10x^2)$       B)  $5x^2y^3(2y^2 - 3x^2)$   
 C)  $x^2y^3(10y^2 - 5 - 15x^2)$       D)  $5x^2y^3(2y^2 - 1 - 3x^2)$

- 34)  $6x^2 + 13x - 63$  34) \_\_\_\_\_  
 A)  $(6x + 13)(x + 63)$       B)  $(2x + 9)(3x - 7)$       C)  $(6x - 7)(x + 9)$       D)  $(2x - 9)(3x + 7)$

- 35)  $9a^2 + 30ab + 25b^2$  35) \_\_\_\_\_  
 A)  $(3a + 5b)^2$       B)  $15(a + b)(a - b)$   
 C)  $2(3a + 5b)$       D)  $(3a + 5b)(3a - 5b)$

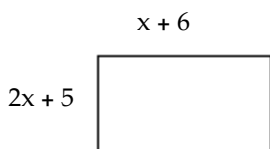
- 36)  $x^2 + 4x + 4 - 25z^2$  36) \_\_\_\_\_  
 A)  $(x + 2 - 5z)(x + 2 + 5z)$       B)  $(5z(x + 2))^2$   
 C)  $(x - 2 - 5z)(x + 2 + 5z)$       D)  $(x + 2 - 5z)^2$

- 37)  $6k^4 - k^2 - 1$  37) \_\_\_\_\_  
 A)  $(6k^2 + 1)(k^2 - 1)$       B)  $2k^2 + 1)(3k^2 - 1)$   
 C)  $(2k^2 - 1)(3k^2 + 1)$       D)  $(2k + 1)(2k - 1)(2k + 1)$

**Solve the problem.**

38) The area of the rectangle shown is  $49 \text{ in.}^2$ . Find the length and the width of the rectangle.

38) \_\_\_\_\_



- A) length: 24.5 in.; width 24.5 in.  
C) length: 8 in.; width 6 in.

- B) length: 7 in.; width 7 in.  
D) length: 19 in.; width 1 in.

**Find all real numbers excluded from the domain of the function. Then give the domain, using set-builder notation.**

39)  $f(x) = \frac{x^2 - 8x}{x^2 + 5x - 36}$

39) \_\_\_\_\_

- A)  $-9, 4; \{x \mid x \neq -9, 4\}$   
C)  $-8, 8; \{x \mid x \neq -8, 8\}$

- B)  $-4, 9; \{x \mid x \neq -4, 9\}$   
D)  $0, 8; \{x \mid x \neq 0, 8\}$

**Multiply or divide.**

40)  $\frac{x^2 - 4}{x^2 - 20x + 100} \div \frac{2x - 4}{x^2 - 8x - 20}$

40) \_\_\_\_\_

A)  $\frac{(x - 2)(x - 2)}{2(x + 10)}$

B)  $\frac{(x + 2)(x + 2)}{2(x - 10)}$

C)  $\frac{(x + 2)(x + 2)}{x - 10}$

D)  $\frac{x - 10}{(x + 2)(x + 2)}$

**Add or subtract as indicated.**

41)  $\frac{2}{15x} + \frac{4}{21x^2}$

41) \_\_\_\_\_

A)  $\frac{6}{315x^2}$

B)  $\frac{2(7x + 10)}{105x^2}$

C)  $\frac{48}{105x^2}$

D)  $\frac{6}{15x + 21x^2}$

42)  $\frac{x}{x^2 - 16} - \frac{6}{x^2 + 5x + 4}$

42) \_\_\_\_\_

A)  $\frac{x^2 - 5}{(x - 4)(x + 4)(x + 1)}$

B)  $\frac{x^2 - 5x + 24}{(x - 4)(x + 4)}$

C)  $\frac{x^2 - 5x + 24}{(x - 4)(x + 4)(x + 1)}$

D)  $\frac{x^2 + 5x + 24}{(x - 4)(x + 4)(x + 1)}$

**Solve.**

43) Sandi can make a quilt in 11 days and Eva can make a quilt in 7 days. In how many days can they make a quilt working together?

43) \_\_\_\_\_

A)  $3\frac{18}{77}$  days

B)  $5\frac{2}{9}$  days

C)  $4\frac{5}{18}$  days

D)  $4\frac{1}{2}$  days

**Evaluate.**

44)  $729^{1/3}$

44) \_\_\_\_\_

A) 19,683

B) 27

C) 9

D) 6561

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

45)  $\left(\frac{25}{49}\right)^{-3/2}$  45) \_\_\_\_\_

A)  $\frac{125}{343}$       B)  $\frac{25}{49}$       C)  $\frac{49}{25}$       D)  $\frac{343}{125}$

Simplify. Assume that all variables represent positive real numbers.

46)  $\sqrt{150} - 3\sqrt{24} + 7\sqrt{96}$  46) \_\_\_\_\_

A)  $27\sqrt{6}$       B)  $-27\sqrt{6}$       C)  $16\sqrt{6}$       D)  $-24\sqrt{6}$

47)  $(2\sqrt{3} + 10)(6\sqrt{3} - 6)$  47) \_\_\_\_\_

A)  $24\sqrt{3}$       B)  $-24 + 48\sqrt{3}$       C)  $96 + 48\sqrt{3}$       D)  $-24 + 72\sqrt{3}$

48)  $\frac{-2}{\sqrt{6}}$  48) \_\_\_\_\_

A)  $-\frac{\sqrt{6}}{3}$       B)  $-2$       C)  $\frac{\sqrt{6}}{3}$       D)  $-\sqrt{2}$

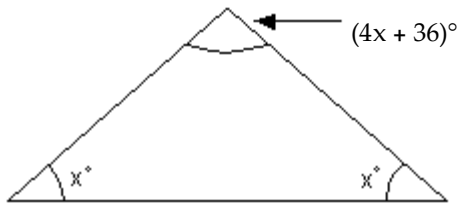
Solve the equation.

49)  $\sqrt{3x - 3} - 10 = 0$  49) \_\_\_\_\_

A)  $\emptyset$       B)  $\left\{\frac{13}{3}\right\}$       C)  $\{100\}$       D)  $\left\{\frac{103}{3}\right\}$

Solve the problem.

50) Find the measure of each angle. 50) \_\_\_\_\_



- A)  $26^\circ, 26^\circ, 128^\circ$       B)  $20^\circ, 20^\circ, 140^\circ$       C)  $24^\circ, 24^\circ, 132^\circ$       D)  $34^\circ, 34^\circ, 112^\circ$