

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Fill in the blank with one of the words or phrases listed below.

rational expression
long division
least common denominator

equation
expression

complex fraction
jointly

opposites
directly

synthetic division
inversely

- 1) A rational expression whose numerator, denominator, or both contain one or more rational expressions is called a _____. 1) _____
 A) least common denominator B) long division
 C) complex fraction D) synthetic division
- 2) To divide a polynomial by a polynomial other than a monomial, we use _____. 2) _____
 A) complex fraction B) expression
 C) long division D) opposites
- 3) In the equation $y = kx$, y varies _____ as x . 3) _____
 A) directly B) opposites C) jointly D) inversely
- 4) In the equation $y = \frac{k}{x}$, y varies _____ as x . 4) _____
 A) jointly B) inversely C) opposites D) directly
- 5) The _____ of a list of rational expressions is a polynomial of least degree whose factors include the denominator factors in the list. 5) _____
 A) synthetic division B) complex fraction
 C) long division D) least common denominator
- 6) When a polynomial is to be divided by a binomial of the form $x - c$, a shortcut process called _____ may be used. 6) _____
 A) synthetic division B) least common denominator
 C) complex fraction D) long division
- 7) In the equation $y = kxz$, y varies _____ as x and z . 7) _____
 A) jointly B) directly C) opposites D) inversely

8) The expressions $(x - 5)$ and $(5 - x)$ are called _____ . 8) _____
 A) complex fraction B) least common denominator
 C) opposites D) synthetic division

9) A _____ is an expression that can be written as the quotient $\frac{P}{Q}$ of two polynomials P and Q 9) _____
 as long as Q is not 0.
 A) long division B) complex fraction
 C) least common denominator D) rational expression

10) Which is an expression and which is an equation? An example of an _____ is $\frac{2}{x} + \frac{2}{x^2} = 7$ and 10) _____
 an example of an _____ is $\frac{2}{x} + \frac{5}{x^2}$.
 A) expression, equation B) equation, expression

Find the domain of the rational function.

11) $f(x) = \frac{3x - 5}{9}$ 11) _____
 A) $\{x \mid x \text{ is a real number and } x \neq 0\}$ B) $\{x \mid x \text{ is a real number and } x \neq 9\}$
 C) $\left\{x \mid x \text{ is a real number and } x \neq \frac{5}{3}\right\}$ D) $\{x \mid x \text{ is a real number}\}$

12) $f(x) = \frac{8x}{-9 - x}$ 12) _____
 A) $\{x \mid x \text{ is a real number and } x \neq -9\}$ B) $\{x \mid x \text{ is a real number and } x \neq 9\}$
 C) $\{x \mid x \text{ is a real number and } x \neq 0\}$ D) $\{x \mid x \text{ is a real number and } x \neq 0, x \neq 9\}$

13) $f(x) = \frac{x}{4x - 7}$ 13) _____
 A) $\left\{x \mid x \text{ is a real number and } x \neq -\frac{4}{7}, x \neq 0\right\}$ B) $\left\{x \mid x \text{ is a real number and } x \neq -\frac{7}{4}\right\}$
 C) $\left\{x \mid x \text{ is a real number and } x \neq \frac{7}{4}\right\}$ D) $\left\{x \mid x \text{ is a real number and } x \neq \frac{4}{7}, x \neq 0\right\}$

$$14) f(x) = \frac{1 - 6x}{x^2 - 4x - 32}$$

14) _____

- A) $\{x \mid x \text{ is a real number and } x \neq 8, x \neq -4\}$
 B) $\left\{x \mid x \text{ is a real number and } x \neq 8, x \neq -4, x \neq \frac{1}{6}\right\}$
 C) $\{x \mid x \text{ is a real number and } x \neq -8, x \neq -4\}$
 D) $\left\{x \mid x \text{ is a real number and } x \neq 8, x \neq -4, x \neq \frac{1}{6}, x \neq 0\right\}$

$$15) f(x) = \frac{x^3 + 7x^4}{x^2 + 36}$$

15) _____

- A) $\left\{x \mid x \text{ is a real number and } x \neq 0, x \neq -\frac{1}{7}\right\}$ B) $\{x \mid x \text{ is a real number and } x \neq -6\}$
 C) $\{x \mid x \text{ is a real number and } x \neq -36\}$ D) $\{x \mid x \text{ is a real number}\}$

Simplify the rational expression.

$$16) \frac{7x - 42}{6x - 36}$$

16) _____

- A) $-\frac{7}{6}$ B) -6 C) 6 D) $\frac{7}{6}$

$$17) \frac{4 - x}{x - 4}$$

17) _____

- A) $\frac{4 - x}{x - 4}$ B) 1 C) $-x$ D) -1

$$18) \frac{3x + 2}{12x^2 + 23x + 10}$$

18) _____

- A) $\frac{3x + 4}{4x + 23}$ B) $\frac{3x + 2}{12x^2 + 23x + 10}$ C) $\frac{1}{4x + 5}$ D) $\frac{3x}{4x + 5}$

$$19) \frac{x^2 + 11x + 30}{x^2 + 12x + 35}$$

19) _____

- A) $-\frac{x^2 + 11x + 30}{x^2 + 12x + 35}$ B) $\frac{11x + 30}{12x + 35}$ C) $\frac{x + 6}{x + 7}$ D) $\frac{11x + 6}{12x + 7}$

$$20) \frac{x^3 - 8}{x - 2}$$

20) _____

- A) $x^2 + 2x + 4$ B) $\frac{1}{x - 2}$ C) $x^2 - 4$ D) $\frac{x^3 - 8}{x - 2}$

Multiply or divide as indicated. Simplify completely.

21) $\frac{2x^2}{5} \cdot \frac{15}{x^3}$ 21) _____

A) $\frac{30x^2}{5x^3}$

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

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

D) $\frac{6x^2}{x^3}$

22) $\frac{5xy^4}{2x^7y^2} \cdot \frac{-6x^6y^7}{20x^8y^{10}}$ 22) _____

A) $-\frac{3}{4x^7y^2}$

B) $-\frac{25y^5}{3x^4}$

C) $-\frac{3}{4x^8y^1}$

D) $-\frac{3}{4x^9y^1}$

23) $\frac{2x-2}{x} \cdot \frac{2x^2}{5x-5}$ 23) _____

A) $\frac{10x^2+20x+10}{2x^3}$

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

C) $\frac{4x^3-4x^2}{5x^2-5x}$

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

24) $\frac{40x+40}{12x-8} \cdot \frac{96x-64}{5x^2-5}$ 24) _____

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

B) $\frac{8}{5(x-1)}$

C) $\frac{64}{(x-1)^2}$

D) $\frac{64}{x-1}$

25) $\frac{x^2-14x+40}{x^2-20x+96} \cdot \frac{x^2-10x+16}{x^2-11x+28}$ 25) _____

A) $\frac{(x^2-14x+40)(x^2-10x+16)}{(x^2-20x+96)(x^2-11x+28)}$

B) $\frac{(x-10)}{(x-7)}$

C) $\frac{(x-10)(x-2)}{(x-12)(x-7)}$

D) $\frac{(x+10)(x+2)}{(x+12)(x+7)}$

26) $\frac{x^2+8x+15}{x^2+10x+21} \cdot \frac{x^2+7x}{x^2+9x+20}$ 26) _____

A) $\frac{x^2+7x}{x+4}$

B) $\frac{1}{x+4}$

C) $\frac{x}{x^2+10x+21}$

D) $\frac{x}{x+4}$

27) $\frac{2x^2}{5} \div \frac{x^3}{15}$ 27) _____

A) $\frac{30x^2}{5x^3}$

B) $\frac{6x^2}{x^3}$

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

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

28) $\frac{9z^3}{y^5} \div \frac{8z^3y^5}{5}$ 28) _____

A) $\frac{45z^6}{8y^{10}}$ B) $\frac{45}{8y^{10}}$ C) $\frac{72z^6}{5}$ D) $\frac{45}{8}$

29) $\frac{x^2 - 18x + 81}{8x - 72} \div \frac{4x - 36}{32}$ 29) _____

A) $\frac{(x - 9)^2}{64}$ B) 32 C) $\frac{x^2 - 18x + 81}{(x - 9)^2}$ D) 1

30) $\frac{x^2 + 13x + 36}{x^2 + 15x + 54} \div \frac{x^2 + 4x}{x^2 + 11x + 30}$ 30) _____

A) $\frac{x}{x^2 + 15x + 54}$ B) $x + 5$ C) $\frac{x + 5}{x}$ D) $\frac{x + 5}{x^2 + 6x}$

31) $\left(\frac{4x^2 + 25x - 21}{7x - 49} \cdot \frac{x^2 - 7x}{16x^2 - 9} \right) \div \frac{3x + 21}{5x^3}$ 31) _____

A) $\frac{3(x + 7)^2}{35x^2(4x + 3)}$ B) $\frac{5x^4}{21(4x + 3)}$ C) $\frac{21}{5x^4(4x + 3)}$ D) $\frac{5x^3}{21(4x + 3)}$

Solve the problem.

32) If $f(x) = \frac{x^3 - 2}{x^2 + 8}$, find $f(2)$. 32) _____

A) $\frac{3}{2}$ B) $\frac{1}{6}$ C) $\frac{2}{3}$ D) $\frac{1}{2}$

33) A company that produces inflatable rafts has costs given by the function $C(x) = 15x + 15,000$, where x is the number of inflatable rafts manufactured and $C(x)$ is measured in dollars. The average cost to manufacture each inflatable raft is given by $\bar{C}(x) = \frac{15x + 15,000}{x}$. Find $\bar{C}(200)$. (Round to the nearest dollar, if necessary.) 33) _____

A) \$90 B) \$24 C) \$80 D) \$23

Perform the indicated operation. Simplify if possible.

34) $\frac{5}{14x} + \frac{6}{14x}$ 34) _____

A) 1 B) $\frac{14x}{11}$ C) $\frac{11}{14x}$ D) $\frac{11}{28x}$

35) $\frac{14}{7x^2} - \frac{10}{7x^2}$ 35) _____

A) $\frac{4}{7x^2}$ B) 4 C) $\frac{7}{4x^2}$ D) $\frac{4}{14x^4}$

36) $\frac{x^2 - 10x}{x - 6} + \frac{24}{x - 6}$ 36) _____
 A) $\frac{x^2 - 10x + 24}{x - 6}$ B) $x + 4$ C) $x - 4$ D) $x - 6$

37) $\frac{4x - 7}{x^2 - 6x + 5} + \frac{6 - 3x}{x^2 - 6x + 5}$ 37) _____
 A) $\frac{1}{x^2 - 6x + 5}$ B) $\frac{1}{x - 5}$ C) $\frac{1}{x - 1}$ D) $\frac{x + 1}{x^2 - 6x + 5}$

Find the LCD of the rational expressions in the list.

38) $\frac{5}{t}, \frac{1}{t - 6}$ 38) _____
 A) 6 B) -6 C) $t(t - 6)$ D) $t - 6$

39) $\frac{1}{9a}, \frac{2}{a^2 + 8a}$ 39) _____
 A) $9a^2 + 2$ B) $9a^2 + 8$ C) $9a + 8$ D) $9a(a + 8)$

40) $\frac{5}{n}, \frac{2n}{3 + n}, \frac{5n}{3 - n}$ 40) _____
 A) $n + 3$ B) $n(3 + n)(3 - n)$ C) $9n^2$ D) $n^2 + 6$

41) $\frac{1}{8xy}, \frac{y^3}{6x^2}$ 41) _____
 A) $24x^3y$ B) $24x^2y$ C) $24xy^2$ D) $24xy^3$

42) $\frac{x + 4}{x^2 - 4x - 5}, \frac{x + 5}{x^2 - 5x - 6}$ 42) _____
 A) $(x + 5)(x - 1)(x - 6)$ B) $(x - 5)(x + 1)(x - 6)$
 C) $(x - 5)(x + 1)$ D) $(x + 1)(x - 6)$

43) $\frac{4}{x^2 - 3x - 4}, \frac{5x + 20}{-5x + 20}$ 43) _____
 A) $-5(x - 1)(x + 4)$ B) $-5(x - 1)(x - 4)$ C) $-5(x + 1)(x + 4)$ D) $-5(x + 1)(x - 4)$

Perform the indicated operation. Simplify if possible.

44) $\frac{2}{13x} + \frac{1}{6x}$ 44) _____
 A) $\frac{25}{78x^2}$ B) $\frac{3}{19x^2}$ C) $\frac{25}{156x}$ D) $\frac{25}{78x}$

45) $\frac{9}{5x} - \frac{2}{7x}$ 45) _____
 A) $\frac{53}{35x^2}$ B) $\frac{53}{35x}$ C) $\frac{7}{35x}$ D) $\frac{53}{70x}$

46) $\frac{3}{r} + \frac{8}{r-5}$ 46) _____
 A) $\frac{11r-15}{r(5-r)}$ B) $\frac{11r-15}{r(r-5)}$ C) $\frac{15r-11}{r(r-5)}$ D) $\frac{15r-11}{r(5-r)}$

47) $\frac{m-5}{m^2-7m+6} + \frac{2m+1}{m^2-5m+4}$ 47) _____
 A) $\frac{3m-4}{2m^2-12m+10}$ B) $\frac{3m^2-20m+14}{(m-1)(m-6)(m-4)}$
 C) $3m-4$ D) $\frac{3m^2-20m+14}{(m+1)(m+6)(m+4)}$

48) $\frac{3x}{x+1} + \frac{4}{x-1} - \frac{6}{x^2-1}$ 48) _____
 A) $\frac{x+1}{x-1}$ B) $\frac{3x-2}{x-1}$ C) $\frac{3x}{x-1}$ D) $\frac{3x-2}{x+1}$

49) $\frac{x}{x^2-16} - \frac{7}{x^2+5x+4}$ 49) _____
 A) $\frac{x^2+6x+28}{(x-4)(x+4)(x+1)}$ B) $\frac{x^2-6x+28}{(x-4)(x+4)}$
 C) $\frac{x^2-6x+28}{(x-4)(x+4)(x+1)}$ D) $\frac{x^2-6}{(x-4)(x+4)(x+1)}$

Simplify.

50) _____ 50) _____

$$\frac{\frac{32}{7x}}{\frac{4}{35x}}$$
 A) $\frac{1}{40}$ B) $\frac{x^2}{40}$ C) 40 D) $40x^2$

51)

$$\frac{1 + \frac{4}{9}}{5 + \frac{5}{9}}$$

A) $\frac{13}{45}$

B) $\frac{7}{9}$

C) $\frac{13}{50}$

D) $\frac{13}{9}$

51) _____

52)

$$\frac{\frac{8}{y}}{\frac{3}{y+3}}$$

A) $\frac{8(y+3)}{3y}$

B) $24y(y+3)$

C) $\frac{y+3}{24y}$

D) $\frac{3y}{8(y+3)}$

52) _____

53)

$$\frac{9 + \frac{3}{x}}{\frac{x}{4} + \frac{1}{12}}$$

A) $\frac{x}{36}$

B) 36

C) 1

D) $\frac{36}{x}$

53) _____

54)

$$\frac{\frac{12}{13-x} + \frac{13}{x-13}}{\frac{5}{x} + \frac{8}{x-13}}$$

A) $-\frac{25x}{13x-65}$

B) $\frac{x}{13x-65}$

C) $-\frac{x}{13x-65}$

D) $\frac{25x}{13x-65}$

54) _____

55)

$$\frac{\frac{5}{x+3} + \frac{15}{x+5}}{\frac{2x+7}{x^2+8x+15}}$$

A) $2x+7$

B) 20

C) $\frac{1}{10}$

D) 10

55) _____

56)

$$\frac{\frac{5}{x} + \frac{7}{x^2}}{\frac{25}{x^2} - \frac{49}{x}}$$

A) $\frac{5x+7}{25-49x}$

B) $\frac{1}{5-7x}$

C) $\frac{5x^2+7}{25-49x}$

D) $\frac{1}{5x-7}$

56) _____

57)

$$\frac{\frac{x-7}{4}}{\frac{x-5}{x}}$$

A) $\frac{4(x-7)}{x(x-5)}$

B) $\frac{4(x-5)}{x(x-7)}$

C) $\frac{x(x-5)}{4(x-7)}$

D) $\frac{x(x-7)}{4(x-5)}$

57) _____

58) $\frac{m^{-1} + z^{-1}}{m^{-1} - z^{-1}}$

A) $\frac{z+m}{z-m}$

B) $\frac{z-m}{z}$

C) $\frac{z+m}{m}$

D) $\frac{z+m}{z}$

58) _____

59) $\frac{x^{-2}}{x^{-2} - y^{-2}}$

A) $\frac{y}{y^2 - x^2}$

B) $\frac{y^2}{y^2 - x^2}$

C) $\frac{y^2}{y^2 + x^2}$

D) $\frac{y^2 - x^2}{y^2}$

59) _____

Divide.

60) $\frac{-25x^2 - 30x - 15}{5}$

A) $-5x^2 - 30x - 15$

C) $-25x^2 - 30x - 3$

B) $-5x^2 - 6x - 3$

D) $-125x^2 - 150x - 75$

60) _____

61) $\frac{6x^8 - 12x^5}{3x^2}$

A) $2x^6 - 12x^5$

B) $2x^6 - 4x^3$

C) $6x^8 - 4x^3$

D) $-2x^{11}$

61) _____

62) $\frac{-20x^6 - 12x^5 - 28x^4}{-4x^5}$

A) $5x + 3$

B) $5x + 3 + \frac{7}{x}$

C) $5x - 12x^5 + \frac{7}{x}$

D) $12x + 3$

62) _____

63) $\frac{-14x^5y^5 - 35x^3y^4 + 28x^2y^3}{7x^2y^3}$ 63) _____

A) $-14x^3y^2 - 35xy + 28$

B) $-2x^3y^2 - 5xy + 4$

C) $-2x^3y^5 - 5x^2y^3 + 4$

D) $-2x^3y^2 - 5xy^4 + 4$

64) $(x^2 - 16) \div (x + 4)$ 64) _____

A) $x + 16$

B) $x - 16$

C) $x - 4$

D) $x^2 - 4$

65) $(x^2 - 16x + 63) \div (x - 7)$ 65) _____

A) $x - 16$

B) $x - 9$

C) $x^2 - 9$

D) $x^2 - 16$

66) $(12x^2 - 19x - 10) \div (x - 2)$ 66) _____

A) $12x + 5$

B) $12x^2 + 19$

C) $x - 19$

D) $12x - 5$

67) $(10x^3 - 33x^2 + 16x + 18) \div (2x - 5)$ 67) _____

A) $5x^2 - 4x - 2 + \frac{8}{2x - 5}$

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

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

D) $5x^2 - 4x - 2 + \frac{11}{2x - 5}$

68) $(10x^3 + x^2 - 70x - 7) \div (5x^2 - 35)$ 68) _____

A) $2x + 5$

B) $2x + \frac{7}{5x^2 - 35}$

C) $2x + \frac{-7}{5x^2 - 35}$

D) $2x + \frac{1}{5}$

69) $(2x^4 - 9x^3 - 4x^2 - 7x + 10) \div (5 - x)$ 69) _____

A) $-2x^3 - 1x^2 - x - 2 + \frac{20}{5 - x}$

B) $-2x^3 - 1x^2 - x + 2$

C) $-2x^3 - 1x^2 + x - 2$

D) $-2x^3 - 1x^2 - x - 2$

Use synthetic division to divide.

70) $\frac{x^2 + 6x - 72}{x - 6}$ 70) _____

A) $x - 12$

B) $x - 12 - \frac{144}{x - 6}$

C) $x + 12$

D) $x + 12 - \frac{144}{x - 6}$

71) $(7x^2 + 36x - 36) \div (x + 6)$ 71) _____

A) $7x - 6$

B) $7x - 6 + \frac{2}{x - 6}$

C) $7x + 6$

D) $x - 6$

72) $(2x^3 + 6x^2 - 16x + 20) \div (x + 5)$ 72) _____
 A) $2x^2 - 4x + 4$ B) $\frac{2}{5}x^2 + \frac{6}{5}x - \frac{16}{5}$ C) $2x - 4$ D) $-2x^2 - 5x + 4$

73) $\frac{x^4 + 256}{x - 4}$ 73) _____
 A) $x^3 + 4x^2 + 16x + 64 + \frac{256}{x - 4}$ B) $x^3 + 4x^2 + 16x + 64$
 C) $x^3 - 4x^2 + 16x - 64 + \frac{512}{x - 4}$ D) $x^3 + 4x^2 + 16x + 64 + \frac{512}{x - 4}$

Solve the equation.

74) $\frac{x}{3} - \frac{x}{4} = 6$ 74) _____
 A) 72 B) 24 C) 12 D) 18

75) $\frac{19}{x} = 4 - \frac{1}{x}$ 75) _____
 A) 5 B) $\frac{2}{9}$ C) 4 D) $\frac{19}{4}$

76) $1 + \frac{1}{x} = \frac{90}{x^2}$ 76) _____
 A) 10, -9 B) -10, 9 C) $-\frac{1}{10}, \frac{1}{9}$ D) 10, 9

77) $\frac{7}{x+3} - \frac{5}{x-3} = \frac{8}{x^2 - 9}$ 77) _____
 A) $\sqrt{36}$ B) 22 C) 44 D) -22

78) $\frac{1}{x+7} + \frac{5}{x+6} = \frac{-1}{x^2 + 13x + 42}$ 78) _____
 A) -7 B) 6 C) 0 D) \emptyset

79) $\frac{5}{4x} - \frac{1}{x+1} = \frac{1}{3x^2 + 3x}$ 79) _____
 A) $-\frac{11}{12}$ B) $-\frac{11}{3}$ C) -11 D) \emptyset

80) $\frac{4}{4-x^2} + \frac{2}{2+x} = \frac{1}{2-x}$ 80) _____
 A) 2, -2 B) -2 C) 2 D) \emptyset

Solve the equation for the specified variable.

81) $P = \frac{A}{1 + rt}$ for r 81) _____
 A) $r = \frac{A - P}{Pt}$ B) $r = \frac{P - 1}{At}$ C) $r = P - tA$ D) $r = \frac{P - A}{1 + t}$

82) $\frac{PV}{T} = \frac{pv}{t}$ for P 82) _____
 A) $P = \frac{pv}{tTV}$ B) $P = \frac{pvT}{tV}$ C) $P = \frac{tvT}{pV}$ D) $P = \frac{pvV}{tT}$

83) $A = \frac{1}{2}h(B + b)$ for B 83) _____
 A) $B = \frac{A - bh}{h}$ B) $B = 2A - bh$ C) $B = \frac{2A - bh}{h}$ D) $B = \frac{2A + bh}{h}$

84) $F = \frac{-GMm}{r^2}$ for M 84) _____
 A) $M = \frac{-Fr^2}{Gm}$ B) $M = -Fr^2 - Gm$ C) $M = \frac{-FGm}{r^2}$ D) $M = \frac{Fr^2}{Gm}$

85) $\frac{1}{a} + \frac{1}{b} = c$ for b 85) _____
 A) $b = ac - \frac{1}{a}$ B) $b = \frac{a}{ac - 1}$ C) $b = \frac{1}{ac}$ D) $b = \frac{1}{c} - a$

86) $\frac{1}{p} + \frac{1}{q} = \frac{1}{f}$ for f 86) _____
 A) $f = p + q$ B) $f = \frac{pq}{p + q}$ C) $f = \frac{p + q}{pq}$ D) $f = pq(p + q)$

Solve.

87) Two times the reciprocal of a number equals 28 times the reciprocal of 35. Find the number. 87) _____
 A) 70 B) $\frac{5}{2}$ C) 9 D) $\frac{8}{5}$

88) Five divided by the difference of a number and 5 equals the quotient of 10 and the sum of the number and 10. Find the number. 88) _____
 A) 3 B) $\frac{20}{3}$ C) 20 D) 0

89) A recent advertisement claimed that 2 out of every 7 doctors recommend a certain herbal supplement to increase energy levels. If a local hospital employs 180 doctors, how many doctors would you expect to recommend the supplement? (Round to the nearest whole number, if necessary.) 89) _____

- A) 630 doctors B) 26 doctors C) 2520 doctors D) 51 doctors

90) To estimate the number of people in Springfield, population 10,000, who have a swimming pool in their backyard, 250 people were interviewed. Of those polled, 99 had a swimming pool. How many people in the city might one expect to have a swimming pool? (Round to the nearest whole number, if necessary.) 90) _____

- A) 2 people B) 25,253 people C) 396 people D) 3960 people

91) A car travels 400 miles on level terrain in the same amount of time it travels 160 miles on mountainous terrain. If the rate of the car is 30 miles per hour less in the mountains than on level ground, find its rate in the mountains. 91) _____

- A) 40 mph B) 50 mph C) 20 mph D) 80 mph

92) In electronics, the relationship among the resistances R_1 and R_2 of two resistors wired in a parallel circuit and their combined resistance R is described by the formula $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$. If the combined resistance of two resistors wired in a parallel circuit is 2 ohms and one of the two resistances is 4 ohms, find the other resistance. 92) _____

- A) $\frac{1}{4}$ ohms B) 2 ohms C) 1 ohms D) 4 ohms

93) A baker can decorate the day's cookie supply four times as fast as his new assistant. If they decorate all the cookies working together in 32 minutes, how long would it take for each of them to decorate the cookies working individually? 93) _____

- A) baker: $9\frac{1}{4}$ minutes B) baker: 160 minutes
assistant: 37 minutes assistant: 640 minutes
C) baker: 160 minutes D) baker: 40 minutes
assistant: 40 minutes assistant: 160 minutes

94) One conveyor belt can move 1000 boxes in 10 minutes. Another can move 1000 boxes in 11 minutes. If another conveyor belt is added and all three are used, the boxes are moved in 3 minutes. How long would it take the third conveyor belt alone to do the same job? 94) _____

- A) $\frac{173}{330}$ minute B) $\frac{47}{330}$ minute C) $7\frac{1}{47}$ minutes D) $1\frac{157}{173}$ minutes

Write an equation to describe the variation. Use k for the constant of proportionality.

95) x varies directly as s 95) _____

- A) $x = \frac{k}{s}$ B) $s = \frac{k}{x}$ C) $x = ks$ D) $s = kx$

If y varies directly as x, find the direct variation equation for the situation.

96) $y = 27$ when $x = 15$

A) $y = x + 12$

B) $y = \frac{5}{9}x$

C) $y = \frac{9}{5}x$

D) $y = 3x$

96) _____

Solve.

97) The amount of water used to take a shower is directly proportional to the amount of time that the shower is in use. A shower lasting 18 minutes requires 14.4 gallons of water. Find the amount of water used in a shower lasting 6 minutes.

97) _____

A) 4.8 gallons

B) 4 gallons

C) 108 gallons

D) 5.6 gallons

98) The distance that an object falls when it is dropped is directly proportional to the square of the amount of time since it was dropped. An object falls 39.2 meters in 2 seconds. Find the distance the object falls in 3 seconds.

98) _____

A) 58.8 meters

B) 88.2 meters

C) 29.4 meters

D) 6 meters

Write an equation to describe the variation. Use k for the constant of proportionality.

99) y varies inversely as s

99) _____

A) $s = \frac{y}{k}$

B) $s = ky$

C) $y = \frac{s}{k}$

D) $y = \frac{k}{s}$

If y varies inversely as x, find the inverse variation equation for the situation.

100) $y = 6$ when $x = 8$

100) _____

A) $y = \frac{3}{4}x$

B) $y = \frac{x}{48}$

C) $y = \frac{48}{x}$

D) $y = \frac{1}{48x}$

101) $y = \frac{1}{7}$ when $x = 21$

101) _____

A) $y = \frac{1}{3x}$

B) $y = \frac{3}{x}$

C) $y = \frac{x}{3}$

D) $y = \frac{1}{147}x$

Solve.

102) When the temperature stays the same, the volume of a gas is inversely proportional to the pressure of the gas. If a balloon is filled with 228 cubic inches of a gas at a pressure of 14 pounds per square inch, find the new pressure of the gas if the volume is decreased to 57 cubic inches.

102) _____

A) 56 pounds per square inch

B) 42 pounds per square inch

C) 52 pounds per square inch

D) $\frac{57}{14}$ pounds per square inch

- 103) If the voltage, V , in an electric circuit is held constant, the current, I , is inversely proportional to the resistance, R . If the current is 300 milliamperes when the resistance is 4 ohms, find the current when the resistance is 20 ohms. 103) _____
- A) 1495 milliamperes B) 60 milliamperes
C) 1500 milliamperes D) 240 milliamperes

Write an equation to describe the variation. Use k for the constant of proportionality.

- 104) q varies jointly as r and s . 104) _____
- A) $qrs = k$ B) $q + r + s = k$ C) $q = k + r + s$ D) $q = krs$
- 105) P varies jointly as R and the square of S . 105) _____
- A) $P = kRS^2$ B) $P = k + R + S^2$ C) $PRS^2 = k$ D) $P + R + S^2 = k$
- 106) q varies jointly as r and the cube of s . 106) _____
- A) $qrs^3 = k$ B) $q + r + s^3 = k$ C) $q = krs^3$ D) $q = k + r + s^3$

Find the variation equation for the variation statement.

- 107) z varies jointly as y and the cube of x ; $z = 2688$ when $x = 4$ and $y = -7$ 107) _____
- A) $y = -6xy^3$ B) $y = 6xy^3$ C) $y = -6x^3y$ D) $y = 6x^3y$

Solve.

- 108) The amount of simple interest earned on an investment over a fixed amount of time is jointly proportional to the principle invested and the interest rate. A principle investment of \$1300.00 with an interest rate of 7% earned \$91.00 in simple interest. Find the amount of simple interest earned if the principle is \$4000.00 and the interest rate is 6%. 108) _____
- A) \$240.00 B) \$280.00 C) \$24,000.00 D) \$78.00
- 109) The power that a resistor must dissipate is jointly proportional to the square of the current flowing through the resistor and the resistance of the resistor. If a resistor needs to dissipate 486 watts of power when 9 amperes of current is flowing through the resistor whose resistance is 6 ohms, find the power that a resistor needs to dissipate when 7 amperes of current are flowing through a resistor whose resistance is 8 ohms. 109) _____
- A) 56 watts B) 392 watts C) 448 watts D) 504 watts

Write an equation to describe the variation. Use k for the constant of proportionality.

- 110) w varies directly as x and inversely as y . 110) _____
- A) $wxy = k$ B) $w + x - y = k$ C) $w = \frac{kx}{y}$ D) $w = \frac{ky}{x}$
- 111) P varies directly as R and inversely as the square of S . 111) _____
- A) $P + R - S^2 = k$ B) $P = \frac{kR}{S^2}$ C) $PRS^2 = k$ D) $P = \frac{kS^2}{R}$

112) p varies directly as the square of q and inversely as the cube of r.

112) _____

A) $p = \frac{kr^3}{q^2}$

B) $p + q^2 - r^3 = k$

C) $p = \frac{kq^2}{r^3}$

D) $pq^2r^3 = k$

113) P varies directly as the square of R and inversely as S.

113) _____

A) $P = \frac{kR^2}{S}$

B) $P = k + R^2 - S^2$

C) $P = \frac{kS}{R^2}$

D) $P = kR^2S$

Find the variation equation for the variation statement.

114) t varies directly as r and inversely as s; t = 3 when r = 27 and s = 72

114) _____

A) $t = \frac{8}{rs}$

B) $t = \frac{8r}{s}$

C) $t = 8rs$

D) $t = \frac{r}{8s}$

115) y varies directly as the square of x; y = 72 when x = 6

115) _____

A) $y = 36x$

B) $y = 72x$

C) $y = 12x$

D) $y = 2x^2$

116) y varies directly as the square of x; $y = -\frac{4}{5}$ when $x = 2$

116) _____

A) $y = -\frac{1}{5}x^2$

B) $y = \left(-\frac{1}{5}x\right)^2$

C) $y = -\frac{4}{5}x$

D) $y = \left(-\frac{4}{5}x\right)^2$

117) y varies inversely as the square of x; y = 2 when x = 6

117) _____

A) $y = \frac{72}{x^2}$

B) $y = \frac{72}{x}$

C) $y = \frac{x}{72}$

D) $y = \frac{x^2}{72}$

Answer Key

Testname: PRACTICE FOR THE EXAM (6.1 - 6.7)

- 1) C
- 2) C
- 3) A
- 4) B
- 5) D
- 6) A
- 7) A
- 8) C
- 9) D
- 10) B
- 11) D
- 12) A
- 13) C
- 14) A
- 15) D
- 16) D
- 17) D
- 18) C
- 19) C
- 20) A
- 21) B
- 22) C
- 23) D
- 24) D
- 25) C
- 26) D
- 27) C
- 28) B
- 29) D
- 30) C
- 31) B
- 32) D
- 33) A
- 34) C
- 35) A
- 36) C
- 37) B
- 38) C
- 39) D
- 40) B
- 41) B
- 42) B
- 43) D
- 44) D
- 45) B
- 46) B
- 47) B
- 48) B
- 49) C
- 50) C

Answer Key

Testname: PRACTICE FOR THE EXAM (6.1 - 6.7)

- 51) C
- 52) A
- 53) D
- 54) B
- 55) D
- 56) A
- 57) D
- 58) A
- 59) B
- 60) B
- 61) B
- 62) B
- 63) B
- 64) C
- 65) B
- 66) A
- 67) A
- 68) D
- 69) B
- 70) C
- 71) A
- 72) A
- 73) D
- 74) A
- 75) A
- 76) B
- 77) B
- 78) D
- 79) B
- 80) D
- 81) A
- 82) B
- 83) C
- 84) A
- 85) B
- 86) B
- 87) B
- 88) C
- 89) D
- 90) D
- 91) C
- 92) D
- 93) D
- 94) C
- 95) C
- 96) C
- 97) A
- 98) B
- 99) D
- 100) C

Answer Key

Testname: PRACTICE FOR THE EXAM (6.1 - 6.7)

- 101) B
- 102) A
- 103) B
- 104) D
- 105) A
- 106) C
- 107) C
- 108) A
- 109) B
- 110) C
- 111) B
- 112) C
- 113) A
- 114) B
- 115) D
- 116) A
- 117) A