

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

Solve for the specified variable.

1) Solve for h : $S = 2\pi rh + 2\pi r^2$

A) $h = 2\pi(S - r)$ B) $h = \frac{S - 2\pi r^2}{2\pi r}$ C) $h = \frac{S}{2\pi r} - 1$ D) $h = S - r$

2) Solve for y : $|y + 2| - 1 = 10$

A) $\{11, 12\}$ B) $\{9\}$ C) $\{-11, 11\}$ D) $\{-13, 9\}$

3) Solve for f : $|7f - 2| = -9$

A) $\left\{-\frac{9}{7}, -1\right\}$ B) $\{-1\}$ C) $\left\{\frac{11}{7}, 1\right\}$ D) \emptyset

4) Solve for h : $|h + 3| + 3 \leq 7$

A) $(-7, 1)$ B) $[-7, 7]$ C) $[-7, 1]$ D) \emptyset

5) Solve for y : $|2y - 1| + 1 > -7$

A) $\left(-\frac{7}{2}, \frac{9}{2}\right)$ B) \emptyset C) $\left(-\frac{7}{2}, \infty\right)$ D) $(-\infty, \infty)$

Find an equation in standard form of the line passing through the two points.

6) $(-5, 6)$ and $(0, -7)$

A) $-13x - 5y = 35$ B) $11x - 7y = -49$ C) $13x - 5y = 35$ D) $-11x + 7y = -49$

Find an equation in slope-intercept form of the line satisfying the given conditions.

7) Through $(-6, 7)$; parallel to $3x + 7y = 3$

A) $y = -\frac{3}{7}x + \frac{31}{7}$ B) $y = \frac{3}{7}x + \frac{3}{7}$ C) $y = \frac{3}{7}x - \frac{31}{7}$ D) $y = -\frac{7}{3}x + \frac{7}{3}$

8) Through $(-5, -2)$; perpendicular to $-5x - 2y = 27$

A) $y = \frac{2}{5}x$ B) $y = \frac{5}{2}x + \frac{21}{2}$ C) $y = -\frac{5}{2}x - \frac{29}{2}$ D) $y = -\frac{2}{5}x - 4$

9) Through $(-3, -2)$ and $(5, 11)$

A) $y = \frac{8}{13}x + \frac{103}{13}$ B) $y = -\frac{13}{8}x + \frac{23}{8}$ C) $y = \frac{13}{8}x + \frac{23}{8}$ D) $y = -\frac{8}{13}x - \frac{103}{13}$

Determine whether the relation defines y as a function of x and give the domain.

10) $y = \sqrt{6x-4}$

A) Not a function ; domain $\left(-\infty, \frac{2}{3}\right]$

B) Function ; domain $\left[\frac{2}{3}, \infty\right)$

C) Not a function ; domain $\left[\frac{2}{3}, \infty\right)$

D) Function ; domain $(-\infty, \infty)$

Evaluate the function at the given value.

11) $f(x) = -7x^2 - 10x + 3$; Find $f(-3)$

A) -40

B) 54

C) -30

D) -34

12) $f(x) = 5x^2 - 4x + 6$; Find $f(k-1)$

A) $5k^2 - 14k + 7$

B) $5k^2 - 14k + 15$

C) $-14k^2 + 5k + 15$

D) $5k^2 + 26k + 7$

Write the equation in function form.

13) $5x - 6y = 5$

A) $f(x) = -5x - \frac{5}{6}$

B) $f(x) = \frac{5}{6}x - \frac{5}{6}$

C) $f(x) = -\frac{5}{6}x + 5$

D) $f(x) = -5x + 5$

Solve the following systems of equations for the y solution.

14) $9x + 5y = -19$

$4x - 3y = 2$

A) $y = -1$

B) $y = -2$

C) \emptyset ; inconsistent system

D) $y = 1$

15) $2x - 3y = -2$

$6x - 9y = 6$

A) $\{(x, y) | 2x - 3y = -2\}$; dependent

B) $y = -4$

C) \emptyset ; inconsistent system

D) $y = 0$

16) $5x - 2y = 3$

$-20x + 8y = -12$

A) $\{(x, y) | 5x - 2y = 3\}$; dependent

B) $y = -9$

C) $y = 1$

D) \emptyset ; inconsistent system

17) $5x - 2y = -1$

$x + 4y = 35$

A) $y = 2$

B) $y = 9$

C) $y = 8$

D) $y = 3$

$$3x + y = -4$$

18) $x = \frac{2}{3}y$

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

B) $y = -\frac{8}{9}$

C) $y = \frac{8}{9}$

D) $y = \frac{4}{3}$

Solve.

19) A soccer field has a perimeter of 320 yards. Its length measures 40 yards more than its width. Find the width.

A) 40 yards

B) 50 yards

C) 60 yards

D) 70 yards

20) A chemist needs 12 L of a 40% alcohol solution. She must mix a 20% solution and a 50% solution. How many liters of the 50% alcohol solution will be required to obtain what she needs?

A) 5 L

B) 6 L

C) 7 L

D) 8 L

21) A cruise boat travels 72 miles downstream in 4 hours and returns to its starting point upstream in 6 hours. Find the speed of the stream

A) 18 mph

B) 15 mph

C) 33 mph

D) 3 mph

22) A woman made a deposit of \$302. If her deposit consisted of 106 bills, some of them one-dollar bills and the rest being five-dollar bills, how many one-dollar bills did she deposit?

A) 47 one-dollar bills

B) 49 one-dollar bills

C) 57 one-dollar bills

D) 52 one-dollar bills

23) Two cars start from points 420 miles apart and travel toward each other. They meet after 3.5 hours. Find the average rate of the faster car if one travels 30 mph slower than the other.

A) 65 mph

B) 70 mph

C) 75 mph

D) 80 mph

Simplify.

24) $\frac{(3x^5y^3)^4}{9xy^2}$

A) $9x^{19}y^{10}$

B) $\frac{x^{19}y^{10}}{3}$

C) $9x^8y^5$

D) $\frac{x^8y^5}{3}$

Add or subtract as indicated.

25) $(7n^7 + 2n + 9n^5) + (-3n^5 + 9n^7 + 2n)$

A) $16n^7 + 6n^5 + 4n$

B) $16n + 6n^7 + 4n^5$

C) $26n^{13}$

D) $11n^7 + 4n^5 + 11n$

26) $(-3x^2 + 4x^4 - 6 + 9x^3) - (-7 - 2x^3 + 7x^4 - 7x^2)$

A) $-3x^4 + 11x^3 + 4x^2 + 1$

C) $11x^4 + 7x^3 - 10x^2 + 1$

B) $-3x^4 + 7x^3 - 10x^2 - 13$

D) $11x^4 + 7x^3 - 10x^2 - 13$

Multiply.

27) $-2x^2y^7(3x^4y^8 - 9y^5 + 7x)$

A) $6x^6y^{15} - 18x^2y^{12} + 14x^3y^7$

C) $-6x^8y^{56} - 18x^2y^{35} + 14x^2y^7$

B) $-6x^6y^{15} - 9y^5 + 7x$

D) $-6x^6y^{15} + 18x^2y^{12} - 14x^3y^7$

28) $(6a + 5b)(7a + 6b)$

A) $42a^2 + ab + 30b^2$

B) $42a^2 - 71ab + 30b^2$

C) $42a^2 + 71ab + 30b^2$

D) $42a^2 + 30b^2$

29) $(2p - 1)(4p^2 + 2p + 1)$

A) $8p^3 - 1$

B) $8p^3 + 1$

C) $4p^3 - 1$

D) $8p^3 + 6p^2 - 1$

30) $(p + 3q)(p - 3q)$

A) $p^2 - 6q^2$

B) $p^2 - 9q^2$

C) $p^2 - 6pq - 9q^2$

D) $p^2 + 6pq - 9q^2$

31) $(3x - 7y)^2$

A) $3x^2 - 42xy + 49y^2$

B) $9x^2 + 49y^2$

C) $3x^2 + 49y^2$

D) $9x^2 - 42xy + 49y^2$

Divide.

32) $\frac{x^2 + 8x + 11}{x + 3}$

A) $x + 5 - \frac{4}{x + 3}$

B) $x + 6$

C) $\frac{x + 5}{x + 3}$

D) $x + 5 + \frac{4}{x + 3}$

33) $\frac{x^2 + 3x - 10}{x + 5}$

A) $x^2 - 2$

B) $x^2 + 4x - 5$

C) $x + 2$

D) $x - 2$

Factor the polynomial completely.

34) $64x^9y^9 + 24x^2y^6 + 64x^7y^3$

A) $8x^2y^3(8x^7y^6 + 3y^3 + 8x^5)$

C) $x^2y^3(64x^7y^6 + 24y^3 + 64x^5)$

B) $8(8x^9y^9 + 3x^2y^6 + 8x^7y^3)$

D) $8x^2(8x^7y^9 + 3y^6 + 8x^5y^3)$

35) $15x^2 - 12xy + 25xy - 20y^2$

A) $(15x + 5y)(x - 4y)$

C) $(3x - 5y)(5x - 4y)$

B) $(3x + 5)(5x - 4)$

D) $(3x + 5y)(5x - 4y)$

36) $8z^2 - 6z - 9$

A) $(8z + 3)(z - 3)$

C) $(4z - 3)(2z + 3)$

B) $(8z + 1)(z - 9)$

D) $(4z + 3)(2z - 3)$

37) $4x^3 + 12x^2y - 40xy^2$

A) $(x - 2y)(4x^2 + 20xy)$

C) $(4x^2 + 8xy)(x - 5y)$

B) $4x(x + 2y)(x - 5y)$

D) $4x(x - 2y)(x + 5y)$

38) $16x^2 - 81$

A) $(4x + 9)^2$

C) $(4x + 9)(4x - 9)$

B) $(16x + 1)(x - 81)$

D) $(4x - 9)^2$

39) $9x^2 - 42xy + 49y^2$

A) $(3x - 7y)(3x + 7y)$

C) $(3x + 7y)^2$

B) $(9x + 1)(x + 49)$

D) $(3x - 7y)^2$

40) $x^3 - 27$

A) $(x + 3)(x^2 - 3x + 9)$

C) $(x + 27)(x^2 - 1)$

B) $(x - 3)(x^2 + 9)$

D) $(x - 3)(x^2 + 3x + 9)$

41) $8c^3 + 125$

A) $(8c + 5)(c^2 - 10c + 25)$

C) $(2c - 5)(4c^2 + 10c + 25)$

B) $(2c + 5)(4c^2 - 10c + 25)$

D) $(2c + 5)(4c^2 + 25)$

42) $27a^4 - 48b^2$

A) $3(3a^2 + 4b)^2$

C) $(9a^2 + 12b)(3a^2 - 4b)$

B) $3(3a^2 - 4b)^2$

D) $3(3a^2 + 4b)(3a^2 - 4b)$

Solve.

43) $2k^2 = 9k - 9$

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

B) $\{3, 6\}$

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

D) $\left\{\frac{3}{2}, 3\right\}$

Simplify.

- 44) $\frac{3x+2}{15x^2+16x+4}$
 A) $\frac{3x}{5x+2}$ B) $\frac{1}{5x+2}$ C) $\frac{3x+5}{5x+16}$ D) $\frac{3x+2}{15x^2+16x+4}$
- 45) $\frac{m^2-4m}{4-m}$
 A) m B) $-(m+2)$ C) $-m$ D) $m+2$
- 46) $\frac{k^2+9k+20}{k^2+10k+24} \cdot \frac{k^2+6k}{k^2-3k-40}$
 A) $\frac{k}{k^2+10k+24}$ B) $\frac{1}{k-8}$ C) $\frac{k}{k-8}$ D) $\frac{k^2+6k}{k-8}$
- 47) $\frac{z^2+9z+18}{z^2+13z+42} \div \frac{z^2+3z}{z^2-2z-63}$
 A) $z-9$ B) $\frac{z-9}{z}$ C) $\frac{z-9}{z^2+7z}$ D) $\frac{z}{z^2+13z+42}$
- 48) $\frac{5}{r} + \frac{6}{r-5}$
 A) $\frac{11r-25}{r(5-r)}$ B) $\frac{25r-11}{r(r-5)}$ C) $\frac{11r-25}{r(r-5)}$ D) $\frac{25r-11}{r(5-r)}$
- 49) $\frac{x}{x^2-16} - \frac{4}{x^2+5x+4}$
 A) $\frac{x^2-3x+16}{(x+4)(x-4)}$ B) $\frac{x^2-3x+16}{(x+4)(x-4)(x+1)}$
 C) $\frac{x^2+3x+16}{(x+4)(x-4)(x+1)}$ D) $\frac{x^2-3}{(x+4)(x-4)(x+1)}$
- 50) $4 + \frac{2}{\frac{x}{\frac{x}{3} + \frac{1}{6}}}$
 A) $\frac{x}{12}$ B) 12 C) 1 D) $\frac{12}{x}$

PART I: ANSWERS

- 1) B
- 2) D
- 3) D
- 4) C
- 5) D
- 6) A
- 7) A
- 8) A
- 9) C
- 10) B
- 11) C
- 12) B
- 13) B
- 14) B
- 15) C
- 16) A
- 17) C
- 18) A
- 19) C
- 20) D
- 21) D
- 22) C
- 23) C
- 24) A
- 25) A

- 26) A
- 27) D
- 28) C
- 29) A
- 30) B
- 31) D
- 32) A
- 33) D
- 34) A
- 35) D
- 36) D
- 37) D
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- 39) D
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- 41) B
- 42) D
- 43) D
- 44) B
- 45) C
- 46) C
- 47) B
- 48) C
- 49) B
- 50) D