

5. Simplify: $\frac{14-30}{2(-4)}$

A) -2

B) 2

C) $\frac{11}{2}$

D) $-\frac{11}{2}$

6. Use the distributive property to simplify. $-3(x-10)+x$

A) $-4x+30$

B) $-4x-30$

C) $-2x+30$

D) $-2x-30$

7. Simplify: $8y-2-3(y-4)$

A) $11y-6$

B) $5y-6$

C) $5y-14$

D) $5y+10$

8. Write the fraction in lowest terms: $\frac{36a^3bc^2}{24ab^4c^2}$

A) $\frac{3b^2}{2a^3}$

B) $\frac{2b^3}{3a^2}$

C) $\frac{3a^2}{2b^3}$

D) $\frac{2a^2}{3b^3}$

9. Solve for x : $3(x+1) = -6$

A) -2

B) -3

C) 1

D) $\frac{7}{3}$

10. Add the polynomials: $2a + 3b + 5a - 7b$

A) $7a - 4b$

B) $7a - 4b$

15. Which of the following numbers is the smallest?

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

B) $-\frac{3}{2}$

C) -1

D) $-\frac{2}{3}$

16. Which of the following is the largest?

A) $|5 - 2|$

B) $|2 - 5|$

C) $|-2 - 5|$

D) $|5 - 2| + |2 - 5|$

17. Solve: $3(x - 5) \leq x - 8$

A) $x \leq \frac{7}{2}$

B) $x \leq \frac{2}{7}$

C) $x \leq -1$

D) $x \geq -1$

18. A flower-bed is in the shape of a triangle with one side twice the length of the shortest side and the third side 15 feet longer than the shortest side. If the perimeter is 100 feet and if x represents the length of the shortest side, find an equation to solve for the lengths of the three sides.

A)

26. Solve: $2x^2 - 5x = 0$

The solutions are:

- A) $x = 0$
- B) $x = 0, x = 5$
- C) $x = 0, x = -5$
- D) $x = 0, x = \frac{5}{2}$

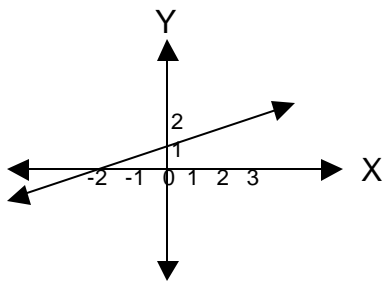
27. Simplify and reduce: $\frac{3x^2 - 12}{9x + 18}$

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

28. Given the equation $-2x + 3y = 12$, find the missing value in the ordered pair $(-3, \underline{\hspace{1cm}})$

- A) -6
- B) -2
- C) 6
- D) 2

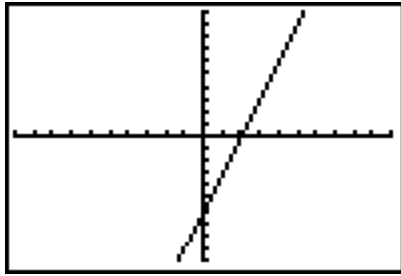
29. What are the coordinates of the x-intercept in the graph below?



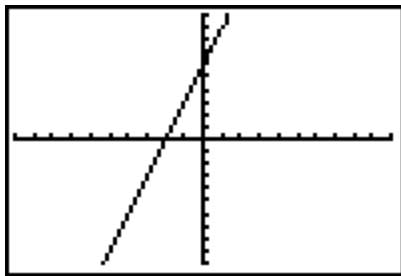
- A) $(-1, 2)$
- B) $(0, -2)$
- C) $(-2, 0)$
- D) $(0, 1)$

30. Graph the line $3x + y = 6$.

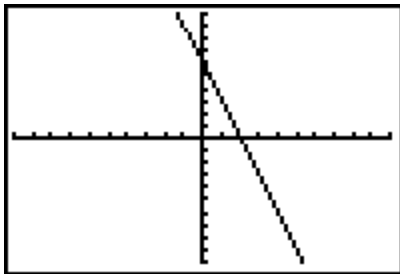
A)



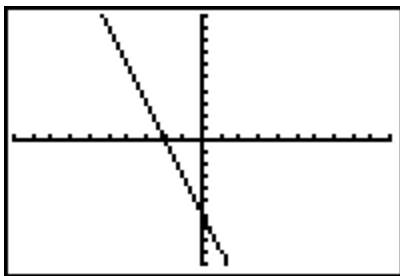
B)



C)



D)



31. Solve and simplify if possible: $\frac{x^2}{x-3} - \frac{9}{x-3} =$

A) $\frac{x}{-3} - \frac{3}{x}$

B) -1

C) $x+3$

D) $x-3$

32. Solve the following system of equations for the y-value: $x + 2y = 7$
 $2x + 2y = 13$

A) $y = \frac{1}{2}$

B) $y = 6$

C) $y = 5$

D) $y = \frac{13}{4}$

33. $\frac{5}{6a} - \frac{2}{3a^2} =$

A) $\frac{3}{6a^2}$

B) $\frac{3}{3a}$

C) $\frac{1}{6a^2}$

D) $\frac{5a-4}{6a^2}$

34. $\frac{9b^2 - 3b}{3b} =$

A) $9b^2 - 1$

B) $3b - 1$

C) $b - 1$

D) $9b$

35. The DoBee.Com Corporation has 5 more than three times as many female as male supervisors. If “x” represents the number of male supervisors write an expression that would represent the total number of female supervisors in terms of “x”.

- A) $x + 5$
- B) $3x + 5$
- C) $4x + 5$
- D) $9x$

36. Which of the following is not an equivalent statement?

- A) $4 - \frac{b^2}{25} = \left(2 - \frac{b}{5}\right)\left(2 + \frac{b}{5}\right)$
- B) $x^5 - 3x^2 = x^2(x^3 - 3)$
- C) $(x^4)^3 = x^7$
- D) $x^{-4} = \frac{1}{x^4}$

37. Charles needs enough fencing to enclose a rectangular garden with a perimeter of 140 feet. If the width of his garden is to be 30 feet, write the equation that can be used to solve for the length of the garden.

40. Which of the following is a factor of both expressions? $x^2 + 4x - 5$
 $2x^2 + 3x - 5$
- A) $(x+5)$
 - B) $(x-5)$
 - C) $(x-1)$
 - D) $(x-3)$

Solutions

Elementary Algebra Sample Items

1. B Evaluate the expression $\frac{3a+2b}{2}$ when $a = -3$ and $b = -4$

$$\begin{aligned} & \frac{3(-3)+2(-4)}{2} \\ & \frac{-9+-8}{2} \\ & \frac{-17}{2} \end{aligned}$$

2. B Simplify: $3+5 \bullet 6-4$

$$\begin{aligned} & 3+5 \bullet 6-4 \\ & 3+30-4 \\ & 33-4=29 \end{aligned}$$

3. C Simplify: $6-2 \bullet 2+2^5$

$$\begin{aligned} & 6-2 \bullet 2+2^5 \\ & 6-2 \bullet 2+32 \\ & 6-4+32 \\ & 2+32=34 \end{aligned}$$

4. A $\frac{3x-y}{6z-x}$ if $x = 2$, $y = 8$, and $z = -2$.

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

$$\frac{6-8}{-12-2}$$

$$\frac{-2}{-14} = 1/7$$

5. B Simplify: $\frac{14-30}{2(-4)}$

$$\frac{14-30}{2(-4)}$$

$$\frac{-16}{-8} = 2$$

6. C Use the distributive property to simplify. $-3(x-10) + x$

$$-3(x-10) + x$$

$$-3x + 30 + x$$

$$-2x + 30$$

7. D Simplify: $8y - 2 - 3(y - 4)$

$$8y - 2 - 3(y - 4)$$

$$8y - 2 - 3y + 12$$

$$5y + 10$$

8. C Write the fraction in lowest terms: $\frac{36a^3bc^2}{24ab^4c^2}$

$$\frac{36a^3bc^2}{24ab^4c^2}$$

$$\frac{3a^{3-1}c^{2-2}}{2b^{4-1}}$$

$$\frac{3a^2c^0}{2b^3}$$

$$\frac{3a^2}{2b^3}$$

9. /

14. D Expand: $(2x-3)^2$

$$(2x-3)^2$$

$$(2x-3)(2x-3)$$

$$4x^2 - 6x - 6x + 9$$

$$4x^2 - 12x + 9$$

15. B Which of the following numbers is the smallest?

Make all of the numbers have common denominators and compare.

$$-\frac{3}{4} = -\frac{9}{12}$$

$$-\frac{3}{2} = -\frac{18}{12} \rightarrow \text{This is the smallest number since } -18 \text{ is the smallest numerator}$$

$$-1 = -\frac{12}{12}$$

$$-\frac{2}{3} = -\frac{8}{12}$$

16. C Which of the following is the largest?

Solve each absolute value and compare results. Remember absolute value is always positive.

$$|5-2| = |3| = 3$$

$$|2-5| = |-3| = 3$$

$$|-2-5| = |-7| = 7 \text{ ? This is the largest}$$

$$|5-2| + |2-5| = |3| + |-3| = 3 + 3 = 6$$

17. A Solve: $3(x-5) \leq x-8$

$$3(x-5) \leq x-8$$

$$3x-15 \leq x-8$$

$$3x-x-15 \leq x-x-8$$

$$2x-15 \leq -8$$

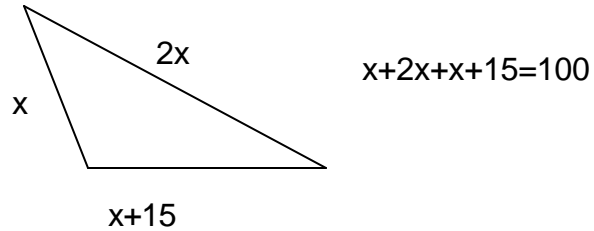
$$2x-15+15 \leq -8+15$$

$$2x \leq 7$$

$$\frac{2x}{2} \leq \frac{7}{2}$$

$$x \leq \frac{7}{2}$$

18. A A flower-bed is in the shape of a triangle with one side twice the length of the shortest side and the third side 15 feet longer than the shortest side. If the perimeter is 100 feet and if x represents the length of the shortest side, find an equation to solve for the lengths of the three sides.



19. B If John has \$50 more money than Mary and you choose to represent John's amount of money as X how should you represent Mary's amount of money in terms of X ?

If John has \$50 more than Mary then Mary must have \$50 less than John.
Therefore if John is represented by X , Mary would be represented by $X-50$.

20. D Multiply: $2x(3x^2 - 5x - 3)$

$$2x(3x^2 - 5x - 3)$$

$$6x^3 - 10x^2 - 6x$$

21. B Divide: _____

28. D Given the equation $-2x + 3y = 12$, find the missing value in the ordered pair $(-3, \underline{\quad})$.

Substitute the “-3” into the equation for x and solve for y.

$$-2x + 3y = 12$$

$$-2(-3) + 3y = 12$$

$$6 + 3y = 12$$

$$3y = 6$$

$$y = 2$$

29. C The x

≡ =

33. D $\frac{5}{6a} - \frac{2}{3a^2} =$ First find common denominators for your fractions.

$$\frac{\quad}{\quad} - \frac{\quad}{\quad} = \frac{\quad}{\quad} - \frac{\quad}{\quad}$$

numerators

$$\frac{5}{6} - \frac{4}{6}$$

39. D For what value(s) of x will each expression be undefined? $\frac{x^2 + 4x + 4}{x^2 + x - 6}$

An expression is undefined when the denominator equals zero. To solve set the denominator equal to zero and solve for x .

$$x^2 + x - 6 = 0$$

$$(x + 3)(x - 2) = 0$$

$$x + 3 = 0 \text{ or } x - 2 = 0$$

$$x = -3 \text{ or } x = 2$$

40. C Which of the following is a factor of both equations? $\frac{x^2 + 4x - 5}{2x^2 + 3x - 5}$

Factor both equations and compare results

$$\begin{array}{l} x^2 + 4x - 5 \\ (x + 5)(x - 1) \end{array} \quad \begin{array}{l} 2x^2 + 3x - 5 \\ (2x + 5)(x - 1) \end{array} \quad \text{The matching factor is } (x - 1)$$