



Elementary

# Alg- ebra

*Elementary Algebra*  
Ch 2: Solving Linear Inequalities

Section 2.1

1. Evaluate  $x+4$  when  $x=-3$ .

**Answer:** 1

2. Evaluate  $15-y$  when  $y=-5$ .

**Answer:** 20

3. Simplify:  $4(4n+1)-15n$ .

**Answer:**  $n+4$

4. Translate into algebra "5 is less than  $x$ ."

**Answer:**  $x-5$

Section 2.2

1. Simplify:  $-7\left(\frac{1}{-7}\right)$

**Answer:** 1

2. Evaluate  $9x+2$  when  $x=-3$ .

**Answer:**  $-25$

Section 2.3

1. Simplify:  $4y-9+9$ .

**Answer:**  $4y$

Section 4

1. Simplify:  $-(a-4)$

**Answer:**  $-a+4$

2. Multiply:  $\frac{3}{2}(12x + 20)$ .

**Answer:**  $18x + 30$

3. Simplify:  $5 - 2(n + 1)$ .

**Answer:**  $3 - 2n$

4. Multiply:  $3(7y + 9)$ .

**Answer:**  $21y + 27$

5. Multiply:  $(2.5)(6.4)$ .

**Answer:** 16

## Section 2.5

1. Multiply:  $8 \cdot \frac{3}{8}$

**Answer:** 3

2. Find the LCD of  $\frac{5}{6}$  and  $\frac{1}{4}$ .

**Answer:** 12

3. Multiply: 4.78 by 100.

**Answer:** 478

## Section 2.6

1. Solve:  $15t = 120$ .

**Answer:** 8

2. Solve:  $6x + 24 = 96$ .

**Answer:** 12

### Section 2.7

1. Translate from algebra to English:  $15 > x$ .

**Answer:** 15 is greater than  $x$ .

2. Solve:  $n - 9 = -42$ .

**Answer:**  $n = -33$

3. Solve:  $-5p = -23$ .

**Answer:**  $p = \frac{23}{5}$

4. Solve:  $3a - 12 = 7a - 20$ .

**Answer:**  $a = 2$

## Elementary Algebra Ch 3: Math Models

### Section 3.1

1. Translate “6 less than twice  $x$ ” into an algebraic expression.

**Answer:**  $2x - 6$

2. Solve:  $\frac{2}{3}x = 24$ .

**Answer:**  $x = 36$

3. Solve:  $3x + 8 = 14$ .

**Answer:**  $x = 2$

### Section 3.2

1. Convert 4.5% to a decimal.

**Answer:** 0.045

2. Convert 0.6 to a percent.

**Answer:** 60%

3. Round 0.875 to the nearest hundredth.

**Answer:** 0.88

4. Multiply:  $(4.5)(2.38)$ .

**Answer:** 10.71

5. Solve:  $3.5 = 0.7n$ .

**Answer:**  $n = 5$

6. Subtract:  $50 - 37.45$ .

**Answer:** 12.55

### Section 3.3

1. Multiply:  $14(0.25)$ .

**Answer:** 3.5

2. Solve:  $0.25x + 0.10(x + 4) = 2.5$ .

**Answer:**  $x = 6$

3. Write an expression for the number of dimes.

**Answer:**  $d = q + 3$

### Section 3.4

1. Simplify:  $\frac{1}{2}(6h)$ .

**Answer:**  $3h$

2. The length of a rectangle is three less than the width. Let  $w$  represent the width. Write an expression for the length of the rectangle.

**Answer:**  $l = w - 3$

3. Solve:  $A = \frac{1}{2}bh$  for  $b$  when  $A = 260$  and  $h = 52$ .

**Answer:**  $b = 10$

4. Simplify:  $\sqrt{144}$ .

**Answer:** 12

### Section 3.5

1. Find the distance travelled by a car going 70 miles per hour for 3 hours.

**Answer:** 210 miles

2. Solve:  $x + 1.2(x - 10) = 98$ .

**Answer:**  $x = 50$

3. Convert 90 minutes to hours.

**Answer:** 1.5 hours

### Section 3.6

1. Write as an inequality:  $x$  is at least 30.

**Answer:**  $x \geq 30$

2. Solve:  $8 - 3y < 41$ .

**Answer:**  $y > -11$

## Elementary Algebra Ch 4: Graphs

### Section 4.1

1. Evaluate  $x+3$  when  $x=-1$ .

**Answer:** 2

2. Evaluate  $2x-5y$  when  $x=3$  and  $y=-2$ .

**Answer:** 16

3. Solve: for  $y$ :  $40-4y=20$ .

**Answer:** 5

#### Section 4.2

1. Evaluate  $3x+2$  when  $x=-1$ .

**Answer:**  $-1$

2. Solve:  $3x+2y=12$  for  $y$  in general.

**Answer:**  $y = \frac{12-3x}{2}$

#### Section 4.3

1. Solve:  $3 \cdot 0 + 4y = -2$

**Answer:**  $-\frac{1}{2}$

#### Section 4.4

1. Simplify:  $\frac{1-4}{8-2}$ .

**Answer:**  $-\frac{1}{2}$

2. Divide:  $\frac{0}{4}, \frac{4}{0}$ .

**Answer:** 0, undefined

3. Simplify:  $\frac{15}{-3}, \frac{-15}{3}, \frac{-15}{-3}$ .

**Answer:**  $-5, -5, 5$

#### Section 4.5

1. Add:  $\frac{x}{4} + \frac{1}{4}$ .

**Answer:**  $\frac{x+1}{4}$

2. Find the reciprocal of  $\frac{3}{7}$ .

**Answer:**  $\frac{7}{3}$

3. Solve:  $2x - 3y = 12$  for  $y$ .

**Answer:**  $y = \frac{12 - 2x}{-3}$

#### Section 4.6

1. Solve:  $\frac{2}{3} = \frac{x}{5}$ .

**Answer:**  $x = \frac{10}{3}$

2. Simplify:  $-\frac{2}{5}x - 15$ .

**Answer:**  $-\frac{2}{5}x + 6$

#### Section 4.7

1. Solve:  $4x + 3 > 23$ .

**Answer:**  $x > 5$

2. Translate from algebra to English:  $x > 5$ .



**Answer:**  $x$  is less than 5.

3. Evaluate  $3x - 2y$  when  $x = 1$ ,  $y = -2$ .

**Answer:** 7

*Elementary Algebra*  
Ch 5: Systems of Linear Equations

Section 5.1

1. For the equation  $y = \frac{2}{3}x - 4$ : (a) is  $6, 0$  a solution? (b) is  $-3, -2$  a solution?

**Answer:** (a) yes (b) no

2. Find the slope and  $y$ -intercept of the line  $3x - y = 12$ .

**Answer:**  $m = 3$ ;  $b = -12$

3. Find the  $x$ - and  $y$ -intercepts of the line  $2x - 3y = 12$ .

**Answer:**  $(6, 0)$ ,  $(0, -4)$

Section 5.2

1. Simplify:  $-5 - 3 - x$ .

**Answer:**  $-15 + 5x$

2. Simplify:  $4 - 2n + 5$ .

**Answer:**  $-2n - 6$

3. Solve: for  $y$ .  $8y - 8 = 32 - 2y$ .

**Answer:**  $y = 4$

4. Solve: for  $x$ .  $3x - 9y = -3$ .

**Answer:**  $x = 3y - 1$

### Section 5.3

1. Simplify:  $-56 - 3a$  .

**Answer:**  $-30 + 15a$

2. Solve: the equation  $\frac{1}{3}x + \frac{5}{8} = \frac{31}{24}$  .

**Answer:**  $x = 2$

### Section 5.4

1. The sum of twice a number and nine is 31. Find the number.

**Answer:** 11

2. Twins Jon and Ron together earned \$96,000 last year. Ron earned \$8,000 more than three times what Jon earned. How much did each of the twins earn?

**Answer:** Jon earned \$22,000 and Ron earned \$74,000.

3. Alessio rides his bike  $3\frac{1}{2}$  hours at a rate of 10 miles per hour. How far did he ride?

**Answer:** 35 miles

### Section 5.5

1. Multiply:  $4.025 \cdot 1,562$  .

**Answer:** 6,287.05

2. Write 8.2% as a decimal.

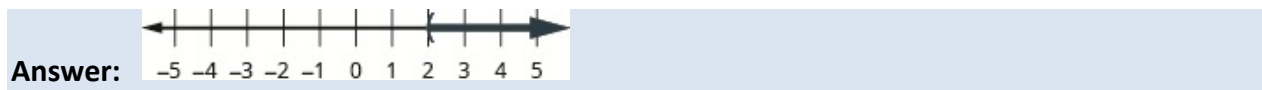
**Answer:** 0.082

3. Earl's dinner bill came to \$32.50 and he wanted to leave an 18% tip. How much should the tip be?

**Answer:** \$5.85

### Section 5.6

1. Graph  $x > 2$  on a number line.



2. Solve: the inequality  $2a < 5a + 12$ .

**Answer:**  $a > -4$

3. Determine whether the ordered pair  $\left(3, \frac{1}{2}\right)$  is a solution to the system  $\begin{cases} x + 2y = 4 \\ y = 6x \end{cases}$ .

**Answer:** no

*Elementary Algebra*  
Ch 6: Polynomials

Section 6.1

1. Simplify:  $8x + 3x$

**Answer:**  $11x$

2. Subtract:  $(5n + 8) - (2n - 1)$ .

**Answer:**  $3n + 9$

3. Write in expanded form:  $a^5$

**Answer:**  $a \cdot a \cdot a \cdot a \cdot a$

Section 6.2

1. Simplify:  $\frac{3}{4} \cdot \frac{3}{4}$

**Answer:**  $\frac{3}{4} \cdot \frac{3}{4}$

2. Simplify:  $(-2)(-2)(-2)$

**Answer:**  $-8$

### Section 6.3

1. Distribute:  $2(x+3)$ .

**Answer:**  $2x+6$

2. Combine like terms:  $x^2+9x+7x+63$ .

**Answer:**  $x^2+16x+63$

### Section 6.4

1. Simplify: (a)  $9^2$  (b)  $(-9)^2$  (c)  $-9^2$

**Answer:** (a) 81 (b) 81 (c)  $-81$

### Section 6.5

1. Simplify:  $\frac{8}{24}$ .

**Answer:**  $\frac{1}{3}$

2. Simplify:  $(2m^3)^5$ .

**Answer:**  $32m^{15}$

3. Simplify:  $\frac{12x}{12y}$ .

**Answer:**  $\frac{x}{y}$

### Section 6.6

1. Add:  $\frac{3}{d}+\frac{x}{d}$ .

**Answer:**  $\frac{3+x}{d}$

2. Simplify:  $\frac{30xy^3}{5xy}$ .

**Answer:**  $6y^2$

3. Combine like terms:  $8a^2 + 12a + 1 + 3a^2 - 5a + 4$ .

**Answer:**  $11a^2 + 7a + 5$

### Section 6.7

1. What is the place value of the 6 in the number 64,891?

**Answer:** Ten thousands

2. Name the decimal: 0.0012

**Answer:** Twelve ten thousandths

3. Subtract:  $5 - (-3)$ .

**Answer:** 8

### Elementary Algebra Ch 7: Factoring

### Section 7.1

1. Factor 56 into primes.

**Answer:**  $2 \cdot 2 \cdot 2 \cdot 7$

2. Find the least common multiple of 18 and 24.

**Answer:** 72

3. Simplify:  $-3(6a+11)$ .

**Answer:**  $-18a - 33$

### Section 7.2

1. Multiply:  $(x + 4)(x + 5)$ .

**Answer:**  $x^2 + 9x + 20$

2. Simplify: (a)  $-9 + (-6)$  (b)  $-9 + 6$ .

**Answer:** (a)  $-15$  (b)  $-3$

3. Simplify: (a)  $-9(6)$  (b)  $-9(-6)$

**Answer:** (a)  $-54$  (b)  $54$

### Section 7.3

1. Find the GCF of  $45p^2$  and  $30p^6$ .

**Answer:**  $15p^2$

2. Multiply:  $(3y + 4)(2y + 5)$ .

**Answer:**  $6y^2 + 23y + 20$

3. Combine like terms:  $12x^2 + 3x + 5x + 9$ .

**Answer:**  $12x^2 + 8x + 9$

### Section 7.4

1. Simplify:  $(12x)^2$ .

**Answer:**  $144x^2$

2. Multiply:  $(m + 4)^2$

**Answer:**  $m^2 - 8m + 16$

3. Multiply:  $(p - 9)^2$ .

**Answer:**  $p^2 - 18p + 81$

4. Multiply:  $(k + 3)(k - 3)$

**Answer:**  $k^2 - 9$

### Section 7.5

1. Factor  $y^2 - 2y - 24$ .

**Answer:**  $(y - 6)(y + 4)$

2. Factor  $3t^2 + 17t + 10$ .

**Answer:**  $(3t + 2)(t + 5)$

3. Factor  $36p^2 - 60p + 25$ .

**Answer:**  $(6p - 5)^2$

4. Factor  $5x^2 - 80$ .

**Answer:**  $5(x - 4)(x + 4)$

### Section 7.6

1. Solve:  $5y - 3 = 0$ .

**Answer:**  $y = \frac{3}{5}$

2. Solve:  $10a = 0$ .

**Answer:**  $a = 0$

3. Combine like terms  $12x^2 - 6x + 4x$ .

**Answer:**  $12x^2 - 2x$

4. Factor  $n^3 - 9n^2 - 22n$  completely.

**Answer:**  $n(n - 11)(n + 2)$

### Section 8.1

1. Simplify:  $\frac{90y}{15y^2}$ .

**Answer:**  $\frac{6}{y}$

2. Factor:  $6x^2 - 7x + 2$ .

**Answer:**  $(2x - 1)(3x - 2)$

3. Factor:  $n^3 + 8$ .

**Answer:**  $(n + 2)(n^2 - 2n + 4)$

### Section 8.2

1. Multiply:  $\frac{14}{15} \cdot \frac{6}{35}$ .

**Answer:**  $\frac{4}{25}$

2. Divide:  $\frac{14}{15} \div \frac{6}{35}$ .

**Answer:**  $\frac{49}{9}$

3. Factor completely:  $2x^2 - 98$ .

**Answer:**  $2(x - 7)(x + 7)$

4. Factor completely:  $10n^3 + 10$ .

**Answer:**  $10(n + 1)(n^2 - n + 1)$

5. Factor completely:  $10p^2 - 25pq - 15q^2$

**Answer:**  $5(2p + q)(p - 3q)$



Section 8.3

1. Add:  $\frac{y}{3} + \frac{9}{3}$ .

**Answer:**  $\frac{y+9}{3}$

2. Subtract:  $\frac{10}{x} - \frac{2}{x}$ .

**Answer:**  $\frac{8}{x}$

3. Subtract:  $\frac{10}{x} - \frac{2}{x}$ .

**Answer:**  $4n^3(2n^2 - 5)$

4. Factor completely:  $45a^3 - 5ab^2$ .

**Answer:**  $5a(3a - b)(3a + b)$

Section 8.4

1. Add:  $\frac{7}{10} + \frac{8}{15}$ .

**Answer:**  $\frac{37}{30}$

2. Subtract:  $6(2x+1) - 4(x-5)$ .

**Answer:**  $8x + 26$

3. Find the Greatest Common Factor of  $9x^2y^3$  and  $12xy^5$ .

**Answer:**  $3xy^3$

4. Factor completely:  $-48n - 12$ .

**Answer:**  $-12(4n + 1)$

Section 8.5

1. Simplify:  $\frac{\frac{3}{5}}{\frac{9}{10}}$ .

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

2. Simplify:  $\frac{1 - \frac{1}{3}}{4^2 + 4 \cdot 5}$

**Answer:**  $\frac{1}{54}$

Section 8.6

1. Solve:  $\frac{1}{6}x + \frac{1}{2} = \frac{1}{3}$ .

**Answer:**  $x = -1$

2. Solve:  $n^2 - 5n - 36 = 0$ .

**Answer:**  $n = 9, n = -4$

3. Solve: for  $y$  in terms of  $x$ :  $5x + 2y = 10$  for  $y$ .

**Answer:**  $y = \frac{10 - 5x}{2}$

Section 8.7

1. Solve:  $\frac{n}{3} = 30$ .

**Answer:**  $n = 90$

2. The perimeter of a triangular window is 23 feet. The lengths of two sides are ten feet and six feet. How long is the third side?

**Answer:** 7 feet

### Section 8.8

1. An express train and a local bus leave Chicago to travel to Champaign. The express bus can make the trip in 2 hours and the local bus takes 5 hours for the trip. The speed of the express bus is 42 miles per hour faster than the speed of the local bus. Find the speed of the local bus.

**Answer:** 28 mph

2. Solve:  $\frac{1}{3}x + \frac{1}{4}x = \frac{5}{6}$ .

**Answer:**  $x = \frac{10}{7}$

3. Solve:  $18t^2 - 30 = -33t$ .

**Answer:**  $t = -\frac{5}{2}, t = \frac{2}{3}$

### Section 8.9

1. Find the multiplicative inverse of  $-8$ .

**Answer:**  $-\frac{1}{8}$

2. Solve: for  $n$ :  $45 = 20n$ .

**Answer:**  $n = 2.25$

3. Evaluate:  $5x^2$  when  $x = 10$ .

**Answer:** 500

## Elementary Algebra Ch 9: Roots and Radicals

### Section 9.1

1. Simplify: (a)  $9^2$  (b)  $-9^2$  (c)  $-9^2$ .

**Answer:** (a) 81 (b) 81 (c)  $-81$

2. Round 3.846 to the nearest hundredth.

**Answer:** 3.85

3. For each number, identify whether it is a real number or not a real number:

(a)  $-\sqrt{100}$  (b)  $\sqrt{-100}$ .

**Answer:** (a) real number (b) not a real number

## Section 9.2

1. Simplify:  $\frac{80}{176}$ .

**Answer:**  $\frac{5}{11}$

2. Simplify:  $\frac{n^9}{n^3}$ .

**Answer:**  $n^6$

3. Simplify:  $\frac{q^4}{q^{12}}$ .

**Answer:**  $\frac{1}{q^8}$

## Section 9.3

1. Add: (a)  $3x + 9x$  (b)  $5m + 5n$ .

**Answer:** (a)  $12x$  (b)  $5m + 5n$

2. Simplify:  $\sqrt{50x^3}$ .

**Answer:**  $5x\sqrt{2x}$

## Section 9.4

1. Simplify:  $3u - 8v$ .

**Answer:**  $24uv$

2. Simplify:  $6 - 12 - 7n$ .

**Answer:**  $72 - 42n$

3. Simplify:  $2 + a - 4 - a$ .

**Answer:**  $8 + 2a - a^2$

### Section 9.5

1. Find a fraction equivalent to  $\frac{5}{8}$  with denominator 48.

**Answer:**  $\frac{30}{48}$

2. Simplify:  $\sqrt{5}^2$

**Answer:** 5

3. Multiply:  $7 + 3x - 7 - 3x$ .

**Answer:**  $49 - 9x^2$

### Section 9.6

1. Simplify: (a)  $\sqrt{9}$  (b)  $9^2$ .

**Answer:** (a) 3 (b) 81

2. Solve:  $5x + 1 - 4 = 3 - 2x - 7$ .

**Answer:** 22

3. Solve:  $n^2 - 6n + 8 = 0$ .

**Answer:**  $n = 2$  or  $n = 4$

### Section 9.7

1. Simplify:  $y^5 y^4$ .

**Answer:**  $y^9$

2. Simplify:  $n^2 \cdot n^6$ .

**Answer:**  $n^{12}$

3. Simplify:  $\frac{x^8}{x^3}$ .

**Answer:**  $x^5$

### Section 9.8

1. Add:  $\frac{7}{15} + \frac{5}{12}$ .

**Answer:**  $\frac{53}{60}$

2. Simplify:  $4x^2y^5 \cdot 3$ .

**Answer:**  $64x^6y^{15}$

3. Simplify:  $5^{-3}$ .

**Answer:**  $\frac{1}{125}$

## Elementary Algebra Ch 10: Quadratic Equations

### Section 10.1

1. Simplify:  $\sqrt{75}$ .

**Answer:**  $5\sqrt{3}$

2. Simplify:  $\sqrt{\frac{64}{3}}$ .

**Answer:**  $\frac{8\sqrt{3}}{3}$

3. Factor:  $4x^2 - 12x + 9$ .

**Answer:**  $(2x - 3)^2$

### Section 10.2

1. Simplify:  $x + 12^2$ .

**Answer:**  $x^2 + 24x + 144$

2. Factor:  $y^2 - 18y + 81$ .

**Answer:**  $y - 9^2$

3. Factor:  $5n^2 + 40n + 80$ .

**Answer:**  $5n + 4^2$

### Section 10.3

1. Simplify:  $\frac{-20 - 5}{10}$ .

**Answer:**  $-\frac{5}{2}$

2. Simplify:  $4 + \sqrt{121}$ .

**Answer:** 15

3. Simplify:  $\sqrt{128}$ .

**Answer:**  $8\sqrt{2}$

### Section 10.4

1. The sum of two consecutive odd numbers is  $-100$ . Find the numbers.

**Answer:**  $-51, -49$

2. The area of triangular mural is 64 square feet. The base is 16 feet. Find the height.

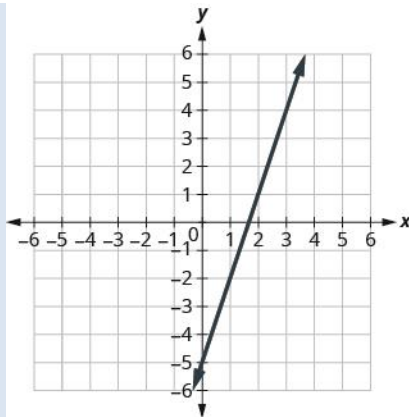
**Answer:** 8

3. Find the length of the hypotenuse of a right triangle with legs 5 inches and 12 inches.

**Answer:** 13 inches

### Section 10.5

1. Graph the equation  $y = 3x - 5$  by plotting points.



**Answer:**

2. Evaluate  $2x^2 + 4x - 1$  when  $x = -3$ .

**Answer:** 5

3. Evaluate  $-\frac{b}{2a}$  when  $a = \frac{1}{3}$  and  $b = \frac{5}{6}$ .

**Answer:**  $-\frac{5}{4}$