

**FINAL REVIEW WORKSHEET  
INTRODUCTORY ALGEBRA**

**Chapter 1.**

1. *Change the following to an algebraic expression: a number multiplied by three hundred fifty-two*

- (A)  $352 - x$  (B)  $352x$  (C)  $352 + x$  (D)  $\frac{352}{x}$

2. *Change the following to an algebraic expression: a number increased by eleven*

- (A)  $11x$  (B)  $11 - x$  (C)  $x + 11$  (D)  $\frac{11}{x}$

3. *Evaluate  $(y - 1)^2$  for  $y = -6$ .*

- (A)  $-7$  (B)  $49$  (C)  $25$  (D)  $-49$

4. *Evaluate  $\frac{2x-3y}{3}$  for  $x = 6$  and  $y = -1$ .*

- (A)  $3$  (B)  $-3$  (C)  $5$  (D)  $-5$

5. *Use the commutative law of addition to write an expression equivalent to  $a + 2b$*

- (A)  $a + b \cdot 2$  (B)  $2b + a$  (C)  $(a + b)2$  (D)  $2ab$

6. *Use the associative law of multiplication to write an expression equivalent to  $(2s)t$*

- (A)  $2s + 2t$  (B)  $(s2)t$  (C)  $t(2s)$  (D)  $2(st)$

7. *Multiply:  $-7(b - 5)$*

- (A)  $-7b + 35$  (B)  $7b + 35$  (C)  $-35b - 7$  (D)  $-7b - 5$

8. Add:  $\frac{7}{8} + \frac{2}{3}$

- (A)  $\frac{7}{12}$  (B)  $\frac{37}{24}$  (C)  $\frac{29}{24}$  (D)  $\frac{9}{11}$

9. Find the reciprocal of  $\frac{6}{5}$ , if it exists.

- (A)  $-\frac{6}{5}$  (B)  $-\frac{5}{6}$  (C)  $\frac{5}{6}$  (D)  $-1$

10. Write the number 504 as the product of prime factors.

- (A)  $2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \cdot 7$  (B)  $2 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 7$  (C)  $2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot 7$  (D)  $2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \cdot 3 \cdot 7$

11. Find the difference.  $-11 - (-8)$

- (A) 3 (B)  $-3$  (C)  $-19$  (D) 19

12. Find the value of the following expression:  $22(-18) + 29(-5)$

- (A) 541 (B) 74 (C)  $-541$  (D) 5170

13. Find the area of a triangle when the height  $h$  is 16 ft. and the base  $b$  is 24 ft.

- (A) 384 sq. ft. (B) 80 sq. ft. (C) 40 sq. ft. (D) 192 sq. ft.

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

- (A)  $2y - 12$  (B)  $-4y + 3$  (C)  $-4y - 12$  (D)  $2y + 3$

15. Simplify the expression by combining like terms.

$$-5(10r^2 + 2) + 7(3r + 6)$$

- (A)  $-50r^2 + 21r + 32$  (B)  $-29r - 3$  (C)  $-60r$  (D)  $21r + 2$

16. Simplify:  $(-4x)^2$   
(A)  $-8x^2$  (B)  $16x^2$  (C)  $-16x^2$  (D)  $16x$

17. Simplify:  $4 \div (-2) \cdot 2 + 3 \cdot (-4)$   
(A) 4 (B)  $-4$  (C)  $-16$  (D) 16

## Chapter 2.

18. Solve the equation:  $21(x - 84) = 42$   
(A)  $x = 86$  (B)  $x = 42$  (C)  $x = 82$  (D)  $x = 84$

19. Solve the equation:  $5 = 2x + 15$   
(A)  $x = 10$  (B)  $x = -10$  (C)  $x = -5$  (D)  $x = 5$

20. Solve the equation:  $4(y - 5) = -2(y + 2)$   
(A)  $y = -12$  (B)  $y = 12$  (C)  $y = \frac{3}{8}$  (D)  $y = \frac{8}{3}$

21. Solve the formula for the specified variable.  $A = 5a + 2ab$  for  $a$ .  
(A)  $a = \frac{2b-a}{5}$  (B)  $a = \frac{A}{5+2b}$  (C)  $a = \frac{A-2b}{5}$  (D)  $a = \frac{A-2b}{5}$

22. Find decimal notation for 6.7%.  
(A) 6.7 (B) 0.067 (C) 0.0067 (D) 0.67

23. Find percent notation for 2.3.  
(A) 2.3% (B) 0.23% (C) 230% (D) 23%

24. 37% of what number is 78? (Round to the nearest hundredth, if necessary)

- (A) 0.47 (B) 210.81 (C) 2108.12 (D) 47

25. What is 38% of 1174? (Round to the nearest hundredth, if necessary)

- (A) 4461.25 (B) 446.12 (C) 44612 (D) 44.61

26. Steve bought a stereo for \$270 and put it on sale at his store at 55% markup rate. What was the retail price of the stereo?

- (A) \$540.00 (B) \$370.00 (C) \$418.50 (D) \$318.50

27. Describe the graph from Figure (1) using set-builder notation.

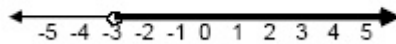


FIGURE 1

- (A)  $\{x|x > -3\}$  (B)  $\{x|x \leq -3\}$  (C)  $\{x|x < -3\}$  (D)  $\{x|x \geq -3\}$

28. Solve the following inequality:  $x - 28 < 20 - 2x$ , graph your answer.



FIGURE 2

29. Solve:  $8 - 3x \geq 20$

- (A)  $\{x|x \leq -4\}$  (B)  $\{x|x \geq -4\}$  (C)  $\{x|x \geq 4\}$  (D)  $\{x|x \leq \frac{28}{3}\}$

30. The perimeter of a rectangle garden is not to exceed 94 feet. The length is 7 feet more than the width. What widths will meet these conditions?

- (A)  $\{w|w \leq 20 \text{ feet}\}$  (B)  $\{w|w \leq 27 \text{ feet}\}$   
 (C)  $\{w|w \geq 27 \text{ feet}\}$  (D)  $\{w|w \geq 18 \text{ feet}\}$

**Chapter 3.** The following bar graph shows the results of a recent survey of 2000 individuals relating information on average income based on years of schooling. Use the graph to answer Problems 31 and 32.

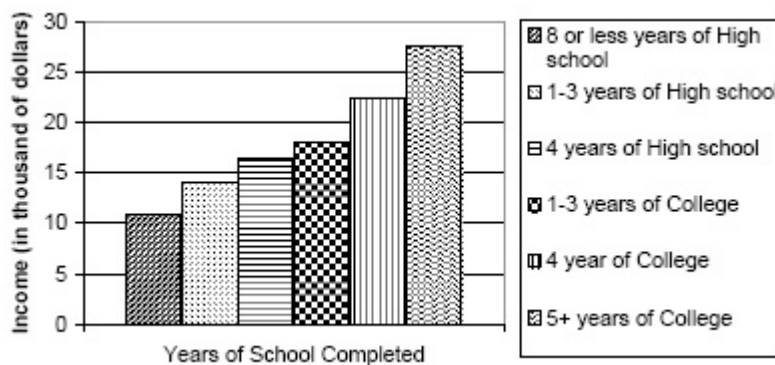


FIGURE 3

31. About how much does a 4-year college graduate earn?

- (A) \$17,000 (B) \$22,500 (C) \$12,000 (D) \$27,000

32. About how much more does a person completing 4-years of high school earn than a person who does not attend high school?

- (A) \$12,000 (B) \$2,000 (C) \$5,000 (D) \$8,000

33. In which quadrant is the point  $(3, -1)$  located?

(A) 1 (B) 2 (C) 3 (D) 4

34. Graph the following line:  $y = -2x + 1$

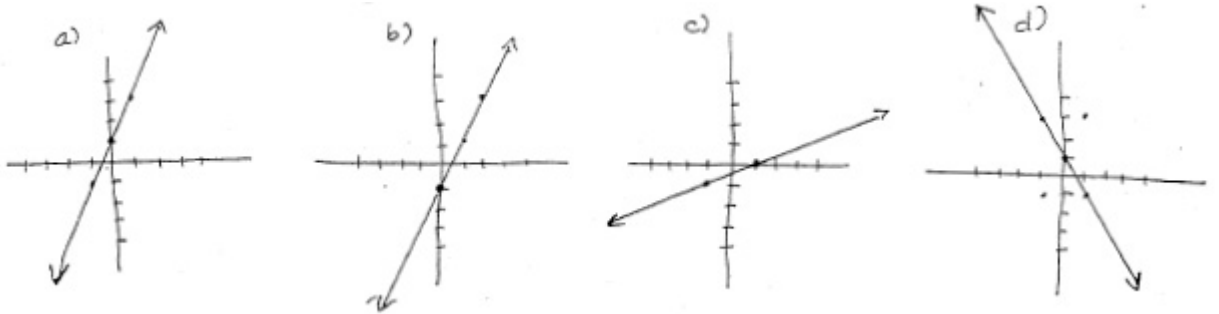


FIGURE 4

35. Find the coordinates of the  $x$ - and  $y$ -intercepts of  $x = 7 - 3y$

(A)  $x$ -int.  $(0, 7)$ ;  $y$ -int.  $(\frac{7}{3}, 0)$  (B)  $x$ -int.  $(7, \frac{7}{3})$ ;  $y$ -int.  $(0, 0)$

(C)  $x$ -int.  $(7, 0)$ ;  $y$ -int.  $(0, \frac{7}{3})$  (D)  $x$ -int.  $(4, 1)$ ;  $y$ -int.  $(10, -1)$

36. Graph the following line:  $y = 2$

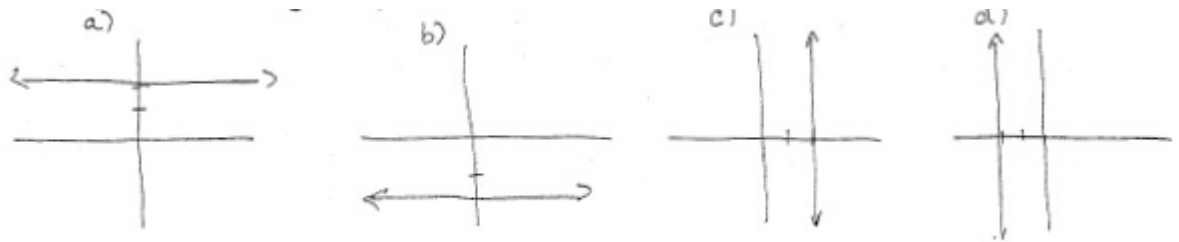


FIGURE 5

37. Write an equation for the graph.

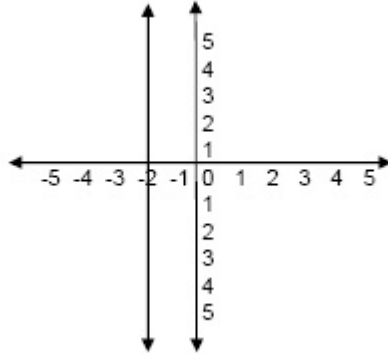


FIGURE 6

- (A)  $y = -2$  (B)  $y = 2$  (C)  $x = -2$  (D)  $x = 2$

38. Nancy drove 550 miles using 32 gallons of gas. What was her gas mileage in miles per gallon?(Round to the nearest tenth, if necessary).

- (A) 17.2 miles per gallon (B) 16 miles per gallon  
(C) 2.9 miles per gallon (D) 43 miles per gallon

39. Find the slope of the line that passes through the points  $(-7, 1)$  and  $(-1, 1)$ .

- (A)  $m = 0$  (B)  $m = 1$  (C)  $m = 8$  (D)  $m = 2$

40. Find the slope and  $y$ -intercept of the line  $-2x + 3y = 9$ .

- (A) slope 1;  $y$ -intercept  $-3$  (B) slope  $-1$ ;  $y$ -intercept 3  
(C) slope  $\frac{2}{3}$ ;  $y$ -intercept 3 (D) slope  $-\frac{2}{3}$ ;  $y$ -intercept  $-3$

41. Write the slope-intercept form of a line with slope  $\frac{6}{5}$  and  $y$ -intercept  $-2$ .

- (A)  $y = -\frac{6}{5}x + 2$  (B)  $y = -\frac{6}{5}x - 2$   
(C)  $y = \frac{6}{5}x - 2$  (D)  $y = \frac{6}{5}x + 2$

**42.** Find a point-slope equation for the line containing the point  $(4, -3)$  and having a slope of  $-5$ .

(A)  $y - 4 = -5(x - 3)$       (B)  $y - 4 = -5(x - (-3))$

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

#### Chapter 4.

**43.** Find the product.  $(4x^2z^3)(3x^4z^3)$

(A)  $12xz$       (B)  $12x^6z^6$       (C)  $12x^8z^9$       (D)  $7x^8z^9$

**44.** Determine the degree of the polynomial.  $5x^4 - 3x + 15x^3 - 9x$

(A) 7      (B) 15      (C) 14      (D) 4

**45.** Perform the indicated operation:  $(3x^4 + 9x^2) - (-15x^4 + 13x^2)$

(A)  $14x^6$       (B)  $18x^4 + 22x^2$       (C)  $-2x^4 + 22x^2$       (D)  $18x^4 - 4x^2$

**46.** Multiply:  $(-5x + 2y)(5x + 4y + 1)$

(A)  $-25x^2 - 20xy - 5x + 8y^2$       (B)  $-25x^2 - 10xy - 5x + 8y^2 + 2y$

(C)  $-25x^2 + 10xy - 5x + 8y^2 + 2y$       (D)  $-25x^2 + 10xy - 10y^2$

**47.** Multiply:  $(8 - 7x)(8 + 7x)$

(A)  $64 - 112x - 49x^2$       (B)  $64 + 112x - 49x^2$       (C)  $64 - 49x^2$       (D)  $64 - 7x^2$

**48.** Multiply:  $(6x - 5y)^2$

(A)  $36x^2 + 25y^2$       (B)  $36x^2 - 60xy + 5y^2$

(C)  $36x^2 + 60xy + 25y^2$       (D)  $36x^2 - 60xy + 25y^2$

49. Evaluate the polynomial  $-2x^2 + xy - y^2$  for  $x = -1$  and  $y = 3$

- (A) 4 (B) 8 (C)  $-8$  (D)  $-14$

50. Divide:  $\frac{20x^5 - 8x^2 + 6x}{2x}$

- (A)  $10x^5 - 4x^2 + 3x$  (B)  $10x^4 - 4x + 3$  (C)  $10x^5 - 8x^2 + 6x$  (D)  $20x^4 - 8x + 3$

51. Divide (use long division):  $\frac{w^2 + 2w - 55}{w + 9}$

- (A)  $w + 7 + \frac{8}{w+9}$  (B)  $w - 7$  (C)  $w - 7 + \frac{8}{w+9}$  (D)  $w - 8 + \frac{7}{w+9}$

52. Simplify:  $(a^{-3})^{-7}$

- (A)  $\frac{1}{a^4}$  (B)  $\frac{1}{a^{21}}$  (C)  $a^{21}$  (D)  $a^4$

53. Express 269.203 in scientific notation.

- (A)  $2.69203 \times 10^1$  (B)  $2.69203 \times 10^2$   
 (C)  $2.69203 \times 10^{-1}$  (D)  $2.69203 \times 10^{-2}$

### Chapter 5.

54. Factor out the greatest common factor:  $18x^7y^9 + 30x^2y^4 - 18x^5y^2$

- (A)  $6(3x^7y^9 + 5x^2y^4 - 3x^5y^2)$  (B)  $6x^2(3x^5y^9 + 5y^4 - 3x^3y^2)$   
 (C) no common factor (D)  $6x^2y^2(3x^5y^7 + 5y^2 - 3x^3)$

55. Find one of the factors when  $x^4 + 2x^3 - 4x - 8$  is factored completely.

- (A)  $x^3 + 2$  (B)  $x^3 - 4$  (C)  $x^2 + 4$  (D)  $x - 2$

56. Factor completely:  $x^2 - 8x - 33$

(A)  $(x - 3)(x + 11)$  (B)  $(x + 3)(x - 11)$

(C)  $(x - 3)(x - 11)$  (D)  $(x + 3)(x + 11)$

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

(A)  $(2x - 3)(2x + 3)$  (B)  $(2x + 3)^2$  (C)  $(2x - 3)^2$  (D) Prime

58. Factor completely:  $25y^4 - 64$

(A) Prime (B)  $(5y^2 + 8)^2$  (C)  $(5y^2 + 8)(5y^2 - 8)$  (D)  $(5y^2 - 8)^2$

59. Solve the equation:  $2x^2 - 16x + 30 = 0$

(A)  $x = 0$  or  $x = 3$  or  $x = 5$  (B)  $x = 2$  or  $x = 3$  or  $x = 5$

(C)  $x = 3$  or  $x = 5$  (D)  $x = -3$  or  $x = -5$

60. The height of a triangle is 8 cm less than the base. The area is 90 sq. cm. Find the height.

(A) 10 cm (B) 12 cm (C) 8 cm (D) 18 cm

## Chapter 6.

61. Simplify this rational expression:  $\frac{a^2 - 2a}{a^2 + 6a - 16}$

(A)  $\frac{a-2}{a+8}$  (B)  $\frac{1}{a+8}$  (C)  $\frac{a^2}{a+8}$  (D)  $\frac{a}{a+8}$

62. Divide and simplify, if possible:  $\frac{z^2 + 10z + 21}{z^2 + 13z + 42} \div \frac{z^2 + 3z}{z^2 + 14z + 48}$

(A)  $\frac{z}{z^2 + 13z + 42}$  (B)  $\frac{z+8}{z}$  (C)  $\frac{z+8}{z^6 + 6z}$  (D)  $z + 8$

63. Subtract:  $\frac{4}{z^2} - \frac{7}{z}$

(A)  $\frac{4-7z}{z^2}$  (B)  $\frac{4z+7}{z^2}$  (C)  $\frac{4+7z}{z^2}$  (D)  $\frac{7z-4}{z}$

64. Add:  $\frac{5ab}{a^2-b^2} + \frac{a+b}{a-b}$

(A)  $\frac{a^2+7ab+b^2}{(a-b)(a+b)}$  (B)  $\frac{a^2+5ab-b^2}{(a-b)(a+b)}$  (C)  $\frac{5ab+a+b}{(a-b)(a+b)}$  (D)  $\frac{7ab}{(a-b)(a+b)}$

65. Simplify:  $\frac{6-\frac{1}{y}}{36-\frac{1}{y^2}}$

(A)  $\frac{1}{6}$  (B)  $\frac{y}{6y+1}$  (C)  $\frac{1}{6} - \frac{1}{y}$  (D)  $\frac{y^2}{6y+1}$

66. Solve this equation:  $\frac{x}{5} - \frac{x}{9} = 3$

(A)  $x = 27$  (B)  $x = 45$  (C)  $x = 15$  (D)  $x = \frac{135}{4}$

67. Solve the equation:  $\frac{x-1}{x-7} = \frac{x-10}{x-4}$

(A)  $x = \frac{11}{2}$  (B)  $x = -\frac{33}{14}$  (C)  $x = -9$  (D)  $x = -3$

68. Solve the equation:  $\frac{15}{x} - \frac{15}{x-2} = -2$

(A)  $x = -5$  or  $x = 3$  (B)  $x = 5$  or  $x = -3$

(C)  $x = 28$  (D)  $x = -5$  or  $x = -3$

69. Frank can type a report in 6 hours and James takes 7 hours. How long will it take the two of them working together to type the report?

(A) 7 hours (B)  $\frac{42}{13}$  hours (C)  $\frac{13}{42}$  (D) 42 hours

**70.** *The sum of a number and 4 times its reciprocal is  $-5$ . Find the number.*

- (A) 1 or 4 (B)  $-1$  or  $-4$  (C)  $-1$  (D)  $-5$  or 1

### Chapter 7.

**71.** *Determine which of the following ordered pairs is the solution of the system of equations.*

$$x = 9 + 4y$$

$$3x - 4y = 3$$

- (A)  $(5, -1)$  (B)  $(-3, -3)$  (C)  $(3, 1)$  (D)  $(-2, -3)$

**72.** *Solve the following:*

$$x - 3y = 5$$

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

*The  $x$ -coordinate of the solution is:*

- (A)  $x = -2$  (B)  $x = 2$  (C)  $x = -1$  (D)  $x = 3$

**73.** *Find an equation of variation in which  $y$  varies inversely as  $x$  when  $y = 35$  and  $x = 32$ .*

- (A)  $y = \frac{1120}{x}$  (B)  $y = \frac{1.09}{x}$  (C)  $y = 1120x$  (D)  $y = 1.09x$

**74.** *Find an equation of variation in which  $y$  varies directly as  $x$  when  $y = 2$  and  $x = 1.6$ .*

- (A)  $y = \frac{1}{1.25}x$  (B)  $y = 1.25x$  (C)  $y = 2x$  (D)  $y = \frac{3.2}{x}$