

**ALGEBRA I FIRST SEMESTER EXAM REVIEW (by Problem Type)**

**Arithmetic: Simplify:**

1.  $-5 + 8 - 7 - 2 - 2$

2.  $-8 - 2 - 1 + 6 - 5 - 3$

3.  $-3 + 5 - 4 - 8 + 3 + 7$

4.  $|6 + 4 + 2 - 15 - 7|$

5.  $\frac{2}{3} + \frac{1}{4} - \frac{5}{6}$

6.  $3\frac{2}{5} + 4\frac{3}{4}$

7.  $3\frac{2}{5} - 4\frac{3}{4}$

8.  $3\frac{2}{5} \cdot 4\frac{3}{4}$

9.  $3\frac{2}{5} \div 4\frac{3}{4}$

10.  $7.007 - 3.03$

11.  $2.37(1.5)$

12.  $8.448 \div 0.32$

13.  $3|5| - 3(2 - 4) + |-3|2$

14.  $2 + 3^2 - 6\sqrt{4}$

15.  $3^2 - 2^3 + (-4)^2$

16.  $4^2 - 2^3 \cdot 3^2 - 8\sqrt{49}$

17.  $\frac{4 \cdot 3 - 3 \cdot 6}{-3 \cdot 1 + 4 \cdot 2}$

18.  $\frac{2(3 - 5) + |-4|}{-2^2 + 3}$

19.  $\frac{\sqrt{49} + 3^2}{|-9| - \sqrt{81}}$

**Solving equations: Solve each equation:**

20.  $8 + n = 14$

21.  $-2 + p = -14$

22.  $d - 6\frac{3}{4} = 1\frac{3}{5}$

23.  $b + \frac{5}{6} = \frac{1}{2}$

24.  $\frac{p}{8} = 1.7$

25.  $\frac{2}{3}z = 4\frac{1}{2}$

26.  $5 + 4b = 21$

27.  $-9 + 6c = 15$

28.  $2x + 7 - 6x = 2 - 2(x + 3)$

29.  $3(2x - 4) = -2(3x - 5) + 5$

30.  $\frac{2x + 3}{6} = \frac{5x - 3}{4}$

31. Solve for y:  $4(2x + 5y) = 3(-2x - 5)$

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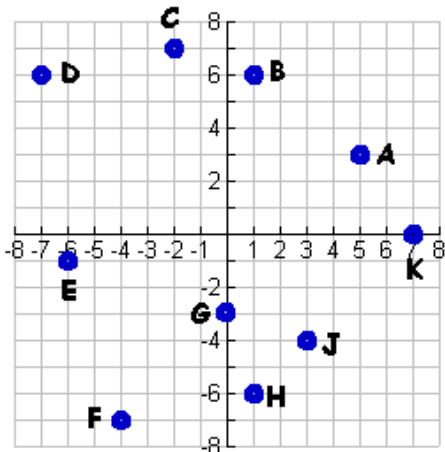
32.  $0.05x - 2.5 = 0.035 + 0.7x$

**Graphing**

33. Graph the following points on a number line and find the length of segments XY, YZ, and XZ.

$X = -8, \quad Y = -2, \quad Z = 7$

34. Give the coordinates of each ordered pair:



35. Plot and label each ordered pair on a rectangular coordinate system. Name the quadrant or axis of each point.

- |            |            |
|------------|------------|
| A) (0,7)   | B) (-6,0)  |
| C) (1,5)   | D) (-3,9)  |
| E) (10,-3) | F) (-4,-7) |
| G) (4,0)   | H) (0,-3)  |
| I) (-1,-8) | J) (-2,5)  |
| K) (7,-2)  | L) (8,6)   |

36. Solve for y and then graph:  
 $2x - 3y - 12 = 0$

37. Graph all three equations on the same set of axes:

- a)  $y = -7$       b)  $x = 5$       c)  $y = x$

38. Graph and find the point of intersection:

$$\begin{cases} 2x - 3y = 12 \\ 6x - 3y = -12 \end{cases}$$

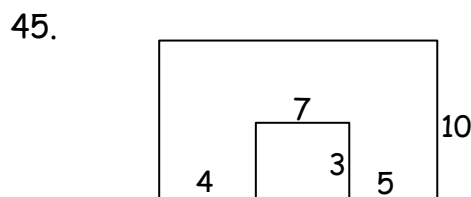
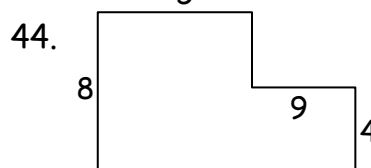
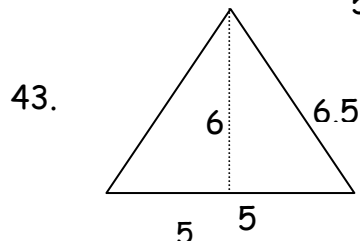
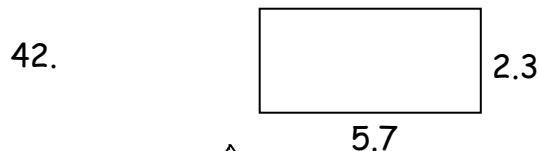
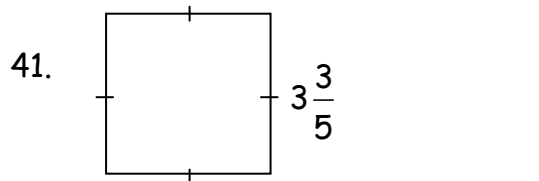
39. Graph and find the point of intersection:

$$\begin{cases} 3x + 4y = 16 \\ 6x + 16 = -8y \end{cases}$$

40. Solve by graphing:  $\begin{cases} x + y = -1 \\ 2x - 3y = 18 \end{cases}$

**Geometry:**

Find the perimeter and the area of each polygon. Dimensions are in inches.



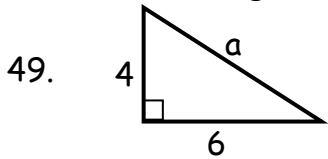
46. Find the perimeter and the area of a circle that has a radius of 5 centimeters.

47. The perimeter of a circle is  $24\pi$  centimeters. What is the circle's radius?

48. The area of a circle is  $36\pi$  square meters. What is the circle's radius?

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Find each missing side:



51. Find the distance between the points  $(-2, 4)$  and  $(-8, 7)$

52. Jill leaves home and travels 9 miles east. She then turns and travels 6 more miles south. How far does she end up from home?

53. Fill in the missing values in the table at the right to complete each set of Pythagorean triples.

Leg	Leg	Hypotenuse
6		10
	12	15
	12	13
3	4	

**Evaluating expressions: Evaluate each expression.**

54.  $xy^2(x+3)$  if  $x = 2$  and  $y = -3$

55.  $x^2 + 3|xy| + \sqrt{12y}$  if  $x = -2$  and  $y = 3$

56.  $x^2(4 - y) + x^0 - \sqrt{5y}$   
if  $x = -2$  and  $y = 5$

57.  $f(x) = x^2 - 6x + 7$ : find  $f(1)$  and  $f(5)$ .

**Like terms and polynomials: Simplify each expression.**

58.  $3x^2 + 4xy^2 - 5x^2 - 6y^2x + 3xy^2$

59.  $3x^2y - 4yx^2 + 6xy^2 - 7y^2x + 5xy$

60.  $4x^2 - 5x + 6 - 9x + 3x^2 - 7$

61.  $-2(3x^2 - 5x - 3) + 3(x^2 - 4x - 2)$

62.  $(5x - 3)(2x + 6)$

63.  $(2x - 1)(3x^2 + 5x - 4)$

64.  $(x^2 + 2x + 1)(2x^2 - 3x + 4)$

Factor:

65.  $8x^3y^4 - 12x^2y^7 - 6x^3y^5$

66.  $4x^2y - 12x^3y + 20x^2y^3$

**Radicals: Simplify each expression.**

67.  $\sqrt{8}$

68.  $\sqrt{20}$

69.  $\sqrt{27}$

70.  $\sqrt{32}$

71.  $\sqrt{2} + \sqrt{3} + 2\sqrt{2} + 3\sqrt{3}$

72.  $5\sqrt{7} + 3\sqrt{5} - 2\sqrt{2} + 2\sqrt{5}$

73.  $\sqrt{8} + \sqrt{18}$

74.  $\sqrt{12} + \sqrt{27}$

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75.  $4\sqrt{32} - 2\sqrt{8} + 3\sqrt{12}$

76.  $2\sqrt{27} - 4\sqrt{20} + \sqrt{45} - 2\sqrt{12}$

77.  $\sqrt{98} - \sqrt{128}$

78.  $\sqrt{7}\sqrt{10}$

79.  $\sqrt{3}\sqrt{5}$

80.  $-3\sqrt{5} \cdot 4\sqrt{10}$

81.  $\frac{\sqrt{21}}{\sqrt{3}}$

82.  $\frac{\sqrt{21}}{\sqrt{7}}$

83.  $\frac{5\sqrt{40}}{2\sqrt{5}}$

84.  $\sqrt{72} + \sqrt{8}\sqrt{6} - \frac{\sqrt{180}}{\sqrt{10}}$

**Exponentials: Simplify each expression.**

85.  $x^2x^3$

86.  $x^2yy^3x^4y^2$

87.  $(3x^3y^3)^4$

88.  $(-2a^2b)^3$

89.  $(2x^2)^2(3y^3)^3$

90.  $(-2xy^2)^3(-3x^2y^4)^2$

91.  $\left(\frac{x^{-2}y^5}{x^3y^{-6}}\right)^{-3}$

**Word problems:**

92. Three-fifths of 75 is what number?

93. What percent of 45 is 18?

94. Three-eighths of what number is 27?

95. The same result is obtained when a number is tripled, and when 10 is added to five times the number. Find the number.

96. Designate the set of natural numbers.

97. Designate the set of integers.

**ANSWERS**

**Arithmetic:**

1. -8

2. -13

3. 0

4. 10

**ANSWERS**

5.  $\frac{1}{12}$

6.  $8\frac{3}{20}$

7.  $-1\frac{7}{20}$

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8.  $16\frac{3}{20}$

9.  $\frac{68}{95}$

10. 3.977

11. 3.555

12. 26.4

13. 27

14. -1

15. 17

16. -112

17.  $-\frac{6}{5} = -1\frac{1}{5}$

18. 0

19. undefined

20.  $n = 6$

21.  $p = -12$

22.  $d = 8\frac{7}{20}$

23.  $b = -\frac{1}{3}$

24.  $p = 13.6$

25.  $z = 6\frac{3}{4}$

26.  $b = 4$

27.  $c = 4$

28.  $x = \frac{11}{2}$

29.  $x = \frac{9}{4}$

30.  $x = \frac{15}{11}$

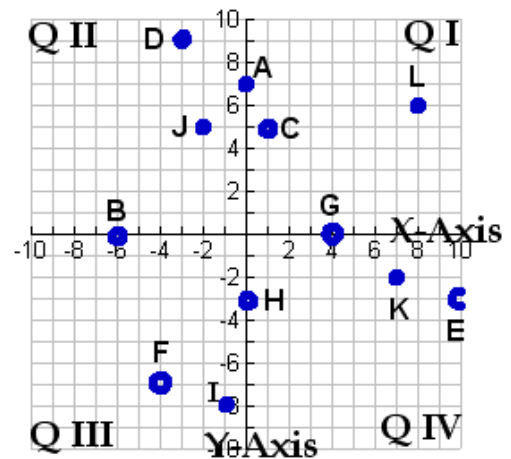
31.  $y = -\frac{7}{10}x - \frac{3}{4}$

32.  $x = -3.9$

33.  $XY = 6, YZ = 9, XZ = 15$

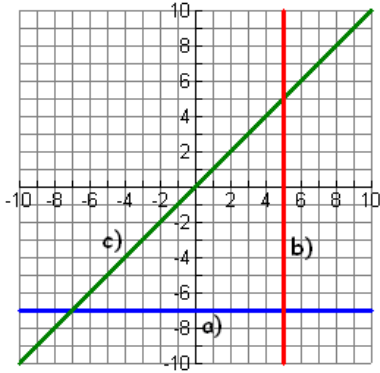
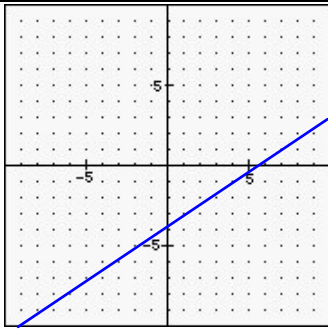
34. A (5, 3)      B (1, 6)  
 C (-2, 7)      D (-7, 6)  
 E (-6, -1)      F (-4, -7)  
 G (0, -3)      H (1, -6)  
 J (3, -4)      K (7, 0)

35.



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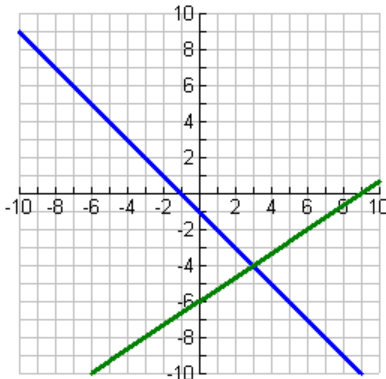
36.  $y = \frac{2}{3}x - 4$



37.

38.  $(-6, -8)$

39. inconsistent



40.

$(3, -4)$

**Geometry:**

41.  $P = 14\frac{2}{5}$  in       $A = 12\frac{24}{25}$  in<sup>2</sup>

42.  $P = 16$  in       $A = 13.11$  in<sup>2</sup>

43.  $P = 18$  in       $A = 15$  in<sup>2</sup>

44.  $P = 44$  in       $A = 76$  in<sup>2</sup>

45.  $P = 58$  in       $A = 139$  in<sup>2</sup>

46.  $P = 10\pi$  cm       $A = 25\pi$  cm<sup>2</sup>

47.  $r = 12$  cm

48.  $r = 6$  m

49.  $a = 2\sqrt{13}$

50.  $b = 4\sqrt{5}$

51.  $3\sqrt{5}$

52.  $3\sqrt{13}$  miles

53. 8, 9, 5, 5

54. 80

55. 28

56. -8

57.  $f(1) = 2, f(5) = 2$

**Like terms and polynomials**

58.  $-2x^2 + xy^2$

59.  $-x^2y - xy^2 + 5xy$

60.  $7x^2 - 14x - 1$

61.  $-3x^2 - 2x$

62.  $10x^2 + 24x - 18$

63.  $6x^3 + 7x^2 - 13x + 4$

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64.  $2x^4 + x^3 + 5x + 4$

65.  $2x^2y^4(4x - 6y^3 - 3xy)$

66.  $4x^2y(1 - 3x + 5y^2)$

**Radicals:**

67.  $2\sqrt{2}$

68.  $2\sqrt{5}$

69.  $3\sqrt{3}$

70.  $4\sqrt{2}$

71.  $3\sqrt{2} + 4\sqrt{3}$

72.  $5\sqrt{7} + 5\sqrt{5} - 2\sqrt{2}$

73.  $5\sqrt{2}$

74.  $5\sqrt{3}$

75.  $12\sqrt{2} + 6\sqrt{3}$

76.  $2\sqrt{3} - 5\sqrt{5}$

77.  $-\sqrt{2}$

78.  $\sqrt{70}$

79.  $\sqrt{15}$

80.  $-60\sqrt{2}$

81.  $\sqrt{7}$

82.  $\sqrt{3}$

83.  $5\sqrt{2}$

84.  $3\sqrt{2} + 4\sqrt{3}$

**Exponentials:**

85.  $x^5$

86.  $x^6y^6$

87.  $81x^{12}y^{12}$

88.  $-8a^6b^3$

89.  $108x^4y^9$

90.  $-72x^7y^{14}$

91.  $\frac{x^{15}}{y^{33}}$

**Word problems:**

92. 45

93. 40

94. 72

95. -5

96.  $\{1, 2, 3, 4, \dots\}$

97.  $\{\dots -3, -2, -1, 0, 1, 2, 3, \dots\}$