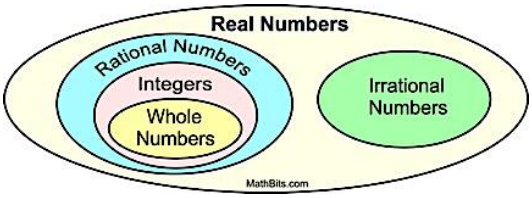
SECTION 1: NUMBER SENSE

Part 1: The Real Number System

Use the diagram to the right to determine the smallest set to which each number belongs



1. -4.2

2. 9

3. $3\sqrt{5}$

4. $\sqrt{16}$

5. $\frac{5}{3}$

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

Part 2: Operations

Find each sum, different, product, or quotient. Simplify any fractions.

7. $(-12) + 7$

8. $4 - (-15)$

9. $\frac{2}{3} + \frac{5}{2}$

10. $2 - \frac{4}{5}$

11. $(30)\left(-\frac{3}{6}\right)$

12. $\frac{1}{8} \div \frac{1}{4}$

Part 3: Comparison

Complete each statement with <, >, or =.

13. 3 _____ 7

14. -1 _____ 4

15. -4 _____ -10

16. |-6| _____ 6

17. $\frac{1}{4}$ _____ $\frac{8}{12}$

18. $\frac{11}{4}$ _____ $\frac{3}{2}$

SECTION 2: EXPRESSIONS AND EQUATIONS

Part 1: Order of Operations
Use the order of operations to evaluate each expression.

1. $8^2 \div (2 \cdot 8) + 2$

2. $\frac{5^2 \cdot 4 - 5 \cdot 4^2}{5(4)}$

3. $\frac{1}{2} \cdot 26 - 3^3$

4. $5 + [30 - (6 - 1)^2]$

5. $250 \div [5(3 \cdot 7 + 4)]$

6. $\frac{2 \cdot 4^2 - (8 \div 2)}{2 \cdot (5+2)}$

Part 2: Evaluating Algebraic Expressions
Evaluate each expression using the values below. Leave your answers as a simplified fraction when necessary.

7. $5x^2 - y$ when x = 4 and y = 24.

8. $x^2 + 3x + 8$ when x = -3.

9. $(z \div x)^2 + \frac{4}{5}x$ when x = 2 and z = 4.

10. $xy - 6z$ when x = 12, y = 9, and z = 4.

Part 3: Combining Like Terms

Simplify each expression by combining like terms.

11. $7x - 1 + 2x$

12. $3x + 2 - 6x + 8 - 1$

13. $-4(2x - 1) + 3x - 7$

14. $3(x + 3) - (2x - 1) + 11x + 8$

Part 4: Solving Equations

Solve each equation for x. Leave your answers as a simplified fraction when necessary.

15. $-14 + x = -2$

16. $\frac{2}{5}x = 6$

17. $14x - 8 = 34$

18. $\frac{3x-7}{5} = 16$

19. $-5x - 10 = 2$

20. $3(x + 8) - 5 = 10$

SECTION 3: LINEAR EQUATIONS

Part 1: Calculating Slope

Use the slope formula to find the slope of the line that passes through each pair of points.

1. (2, 5) and (6, 2)

2. (1, -2) and (-2, -5)

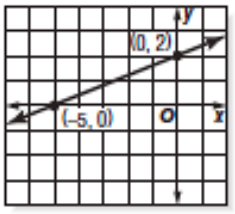
Part 2: Writing Equations

Write the equation of the line in the form y = mx + b.

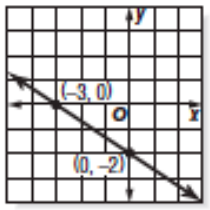
3. Slope = 2
y-intercept = 3

4. Slope = $\frac{4}{3}$
y-intercept = -4

5.



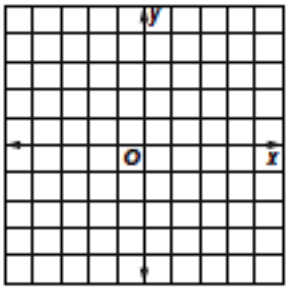
6.



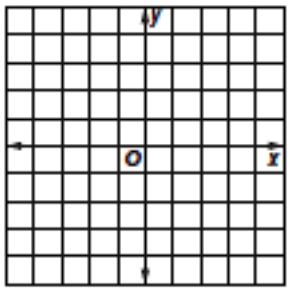
Part 3: Graphing Lines

Graph each line.

7. $y = -\frac{1}{2}x + 2$



8. $y = 2x - 3$



SECTION 4: WORD PROBLEMS

1. Write an algebraic expression for the verbal expressions below.

a. Four times a number is decreased by twelve. _____

b. Three more than the product of five and a number. _____

c. The quotient of two more than a number and eight. _____

d. Seven less than twice a number. _____

e. A number decreased by 12 is less than 48. _____

2. Two dogs in a park are named Roy and Spot. Roy weighs 20 pounds more than Spot. If the sum of their weights is 250 pounds, how much does each dog weigh?

3. Three-fourths of the student body attended the pep rally. If there were 1,230 students at the pep rally, how many students are there in total?

4. Susie went to the mall and spent $41 on t-shirts and socks. Susie only bought 1 pair of socks for $5 and spent the rest on t-shirts that cost $12 each. How many t-shirts did Susie buy?

5. A gym membership charges a one-time fee of $50 plus $15 every month. How much would it cost to use the gym for 5 months?