

**PROBLEM SOLVING SESSION**  
**MATH 020**  
**Weeks I, II and III**  
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**MATH 020**

Rev.2005

**Weeks I , II, III:**

**Evaluate the expression** when  $x = -2$ ,  $y = 6$ , and  $z = -3$

1)  $y - x^2$

2)  $xy - z^2$

3)  $z - \frac{y}{z}$

4)  $\frac{16x^3z^2}{y}$

**Simplify:**

1)  $4a + 3a$

2)  $-4ab - 10ab$

3)  $12xy - 5 + 8xy$

4)  $-15ab + 3a + 4ab - 2a$

5)  $4(a - 6)$

6)  $6x - 2(x - 9)$

**Evaluate:**

1) Is  $-5$  a solution of  $x^2 - 3x - 1 = 9 - 6x$  ?

2) Is  $\frac{2}{5}$  a solution of  $5x(x+1)$ ?

**Solving Equations:**

**Solve - (Addition Principle)**

1)  $z - 4 = -10$

2)  $3 - x = 14$

3)  $1 + x = 0$

4)  $x + \frac{1}{2} = -\frac{1}{3}$

5)  $x + \frac{1}{3} = \frac{5}{12}$

6)  $\frac{7}{8} - y = -\frac{1}{8}$

**Solve - (Multiplication Principle):**

1)  $-24 = 4y$

2)  $\frac{x}{3} = 5$

3)  $3a = -27$

4)  $\frac{y}{7} = -3$

5)  $-\frac{x}{4} = 1$

6)  $-4 = -\frac{2}{3}z$

**Solve:**

1)  $6 - x = 3$

2)  $8 - 6x = 14$

3)  $-2x + 15 = -3$

4)  $-13x - 1 = -1$

5)  $\frac{2}{9}t - 3 = 5$

6)  $\frac{1}{2}x + 3 = -8$

7)  $0.4x - 2.3 = 1.3$

8)  $5x - 3x + 2 = 8$

**Translate into a mathematical expression:**

1) 4 more than y

2) 5 less than x

3) 10 divided by t

4) The product of -8 and n

5) Half of a number

6) The difference of two numbers

7) The product of 6, and the sum of 3 more than y

8) 5 times some number

9) The quotient of five times a number and the number

10) The square of a number divided by the sum of that number and eight

**Percents****Write each percent in fractional and decimal notation:****PERCENT****FRACTION****DECIMAL**

1) 8%

\_\_\_\_\_

\_\_\_\_\_

2) 40%

\_\_\_\_\_

\_\_\_\_\_

3) 87%

\_\_\_\_\_

\_\_\_\_\_

4) 425%

\_\_\_\_\_

\_\_\_\_\_

5) 32%

\_\_\_\_\_

\_\_\_\_\_

6)  $5 \frac{3}{4} \%$ 

\_\_\_\_\_

\_\_\_\_\_

7)  $8\frac{2}{3}\%$

\_\_\_\_\_

\_\_\_\_\_

8) 12.3%

\_\_\_\_\_

\_\_\_\_\_

9) 5.05%

\_\_\_\_\_

\_\_\_\_\_

10) .45%

\_\_\_\_\_

\_\_\_\_\_

11) 255%

\_\_\_\_\_

\_\_\_\_\_

12) 73%

\_\_\_\_\_

\_\_\_\_\_

**Fill in the blank:****Percent**
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
**Decimal**
 2.07  
 0.005  
 3.25  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
**Fraction**
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 1/8  
 7/30  
 12/25
**Percent Equations and General Equations****I. Solve :**

- 16% of 50 is what number?
- 26.5% of 19.5 is what number?
- $83\frac{1}{3}\%$  of 246 is what number?
- 38% of what number is 171?
- 10.4% of what number is 52?
- 180% of what number is 21.6?
- 120 is  $33\frac{1}{3}\%$  of what number?
- $83\frac{1}{3}\%$  of what number is 13.5?

9. What percent of 400 is 12?
10. What percent of 24 is 18?
11. 54 is what percent of 100?
12. What percent of 80 is 20?
13. A used Chevrolet Blazer was purchased for \$22,400. This was 70% of the cost of the Blazer when new. What was the cost of the Blazer when it was new?
14. A student answered 78 questions correctly on an exam out of 150. What percent of the questions were answered correctly?
15. A sales person received a commission of \$1640 for selling a car. This was 5% of the selling price of the car. What was the selling price of the car?

## II. Solve and check:

- |                    |                            |
|--------------------|----------------------------|
| 1. $6 - x = 3$     | 5. $\frac{2}{9}t - 3 = 5$  |
| 2. $8 - 6x = 14$   | 6. $\frac{1}{2}x + 3 = -8$ |
| 3. $-2x + 15 = -3$ | 7. $.4x - 2.3 = 1.3$       |
| 4. $-13x - 1 = -1$ | 8. $5x - 3x + 2 = 8$       |

## General Equations and Inequalities

### I. Solve and check:

- |                       |                         |
|-----------------------|-------------------------|
| 1. $4 - 3x = 4 - 5x$  | 6. $3x - 9 = -6x$       |
| 2. $4x - 3 = 7 - x$   | 7. $3x + 2(x + 4) = 13$ |
| 3. $2x + 6 = 7x + 6$  | 8. $6 - 3(x - 4) = 12$  |
| 4. $-8 + 5x = 8 + 6x$ | 9. $3(x - 5) + 2x = 10$ |
| 5. $-3 - 4x = 7 - 2x$ | 10. $3x - 6(x - 3) = 9$ |

### II Solve and graph the solution set on a number line.

- |                   |                            |
|-------------------|----------------------------|
| 1. $x + 2 > 6$    | 6. $\frac{-3}{2}x \geq 12$ |
| 2. $y - 3 < 2$    | 7. $5y + 3 > -1 + 3y$      |
| 3. $4 \leq 6 + x$ | 8. $12 - 2x \leq 4x$       |

4.  $5x + 1 \geq 4x - 2$

9.  $2x + 5 > 8x - 19$

5.  $-9y \leq 63$

10.  $10 - x > 3(2x - 5)$

### III Uniform Motion Problems

1. Two airplanes leave Dallas at the same time in opposite directions. If one travels at 450 miles per hour and the other at 550 miles per hour, how long will it take for them to be 4000 miles apart?
  
  
  
  
  
  
  
  
  
  
2. Two cyclists start from the same point at the same time and move in opposite directions. One cyclist is traveling at 8 miles per hour, and the other cyclist is traveling at 11 miles per hour. After 30 minutes, how far apart are the two cyclists?