

**MATH 110**      **Test 1 (Sec. 1.1 - 2.5)**

**Show all your work. No work no credit.**

1. (2 each) Simplify and write your answer in lowest terms:

a)  $\frac{4}{5} + \frac{2}{3}$

b)  $\frac{3}{4} \cdot \frac{8}{3} - \frac{5}{2} \cdot \frac{6}{3}$

c)  $5\frac{7}{8} - 2\frac{1}{2}$

d)  $\frac{14}{29} \div \frac{35}{27}$

2. (6 pts) Identify the rationals and irrationals:

$$\left\{ \frac{-5}{3}, -5, 2.1762 \dots, \sqrt{13}, \sqrt{16}, 0, 3, 3.125125 \dots \right\}$$

**Rationals:**

**Irrationals:**

3. (4 pts) Find the volume of the cone with height  $h = 15$  cm, and radius of the circular base  $r = 6$  cm. Use  $\pi \approx \frac{22}{7}$  (Use  $V = \frac{1}{3}\pi r^2 h$ )

4. (3 each) Solve the equation and check your answer:

a)  $y - 3 = -11$

b)  $36x = -12$

c)  $r - \frac{1}{5} = \frac{7}{15}$

d)  $53 + 6t = 65$

e)  $4x - 5 = 13 - 2x$

f)  $-6(t - 2) = 3(7 - 5t)$

g)  $1.9x - 4(x + 0.3) = -46.5$

h)  $\frac{3y - 10}{4} = 5$

5. (4 pts) Consider the algebraic expression  $5x^3 - 4x^2w - 7xwz$ . What factor is common to all these terms? What is the numerical coefficient of the third term?

**Common Factor**

**Coefficient of the third term**

6. (3 each) Perform the indicated operations and simplify:

a)  $7(4 - 2)^2 - 4^2 + 2^2 \div 4 + 1$

b)  $\frac{(5 - 2)^2 + 7}{5^2 - (11 + 6)}$

c)  $(-2)^5$

d)  $\left(\frac{7}{3} - \frac{5}{6}\right) - \left(\frac{5}{6} - \frac{-7}{3}\right)$

e)  $\left[\frac{1}{3} - \left(\frac{2}{3}\right)^2\right]^2$

f)  $\left(\frac{1}{2} - \frac{2}{3}\right)\left(\frac{1}{2} + \frac{2}{3}\right)$

7. (2 each) Simplify the expression by combining like terms.

a)  $11xy - 12xy$

b)  $2x + 4(y - x) + 3y$

8. (4 pts) A clerk's sales in February were \$2,000 less than 3 times her sales in January. If her February sales were \$7,300, by what amount did her sales increase?

9. (2 each) Use the distributive property to simplify.

a)  $-2(xy - 1)$

b)  $x(x - y + t)$

10. (4 pts) Find the Additive inverse and Multiplicative inverse of  $-5$

Choose **2** of the following 3 word problems. The third is extra credit.

11. (6 pts.) Two trains are 330 miles apart and their speeds differ by 20 mph. They travel toward each other and meet in 3 hours. Find the speed of each train.

12. (6 pts) How many gallons of a 10% salt solution must be mixed with 20 gallons of a 7% solution to obtain an 8% solution?

13. (6 pts.) When equal amounts are invested in each of three accounts paying 5%, 6%, and 7.5%, one year's combined interest income is \$1850. How much is invested at each rate?

14. (3 pts.) What percent of 225 is 33.75?

15. (2 each) Find the complement of  $15^\circ =$   
and supplement of  $45^\circ =$

16. (3 pts) Evaluate at  $x = -2$ ,  $y = 4$ , and  $z = 1$

$$2y^2z^2 - 3x(y - z)$$

17. (**BONUS 5 pts.**) If the radius of a circle is  $\pi$  inches, how much is its diameter?