

MS 100 Sample Test 1 (Sections P.1, 1.2-1.5)

01. (04 pts) Evaluate the expression: $-|1| + |-3| = -1 + 3 = 2$

a) 2

b) 4

c) -1,3

d) -4

02. (04 pts) Consider the set of numbers: $x > 5$.

a) Write the set using **interval notation**.(5, ∞)b) Is the set **BOUNDED** or **UNBOUNDED**?

03. (06 pts) Here is a verbal description of a set of numbers:

"The set of all numbers x less than 10 and greater than or equal to 5".

a) Write an **inequality** that describes this set. $5 \leq x < 10$ b) Describe the set using **interval notation**.

[5, 10)

c) Graph the set on the real number line $\leftarrow \dots \dots \dots 0 \dots \dots [5 \dots \dots 10) \dots \dots \rightarrow$

d) Is the set **BOUNDED** or **UNBOUNDED**?

04. (04 pts) Circle the solution to the equation $5x + 1 = x - \frac{1}{3}$.

a) -6

b) $\frac{3}{5}$

c) 3

d) $-\frac{1}{3}$

$$5x + 1 = x - \frac{1}{3} \Rightarrow 3(5x + 1) = 3(x - \frac{1}{3}) \Rightarrow 15x + 3 = 3x - 1 \Rightarrow 12x = -4 \Rightarrow x = -\frac{1}{3}$$

05. (04 pts) Solve the equation $ax + b = 0$ for x . Circle your answer.

a) $x = \frac{1}{a+b}$ b) $x = \frac{1}{a-b}$ c) $x = \frac{-b}{a}$ d) $x = \frac{a}{b}$

06. (04 pts) What is 7% of 142?

a) 0.049

b) 994

c) 20.29

d) 9.94

$$.07 * 142 = 9.94$$

07. (04 pts) If I make \$18,000 per year and my salary is increased by 3%, what is my new salary?

a) \$18,003

b) \$18,300

c) \$18,540

d) \$54,000

$$\text{New} = 18000 + (.03) 18000 = 18,540$$

08. (05 pts) A rectangular room has a perimeter of 26 feet. One side is seven feet longer than the other.

a) Find the dimensions of the room. **length** = 10 **width** = 3

$$\text{Perimeter Formula: } P = 2L + 2W$$

$$L = W + 7$$

$$26 = 2L + 2W$$

$$26 = 2(W + 7) + 2W \Rightarrow 4W = 12 \Rightarrow W = 3$$

b) What is the area of the room(include units)?

$$A = LW = 10 * 3 = 30 \text{ square ft.}$$

09. (04 pts) A rectangular room is 3 times longer than it is wide. The perimeter of the room is 24 meters. Find the dimensions of the room. **length** = 9 **width** = 3

Perimeter Formula: $P = 2L + 2W$

$$L = 3W$$

$$24 = 2L + 2W$$

$$24 = 2(3W) + 2W \Rightarrow 8W = 24 \Rightarrow W = 3$$

10. (04 pts) Solve the following by **factoring**: $x^2 + 3x = 10$ Solutions $x = \{ -5, 2 \}$

$$x^2 + 3x = 10 \Rightarrow x^2 + 3x - 10 = 0 \Rightarrow (x+5)(x-2) = 0$$

The solutions are x -values that make each factor equal 0.

11. (04 pts) Solve the following by using the **Quadratic Formula**: $x^2 - 4x = 6$. Circle the correct answer.

a) 5.16, -1.16

b) $\frac{4 \pm \sqrt{40}}{2}$

c) $\frac{-4 \pm \sqrt{16 - 4(1)(6)}}{2}$

d) -4, -2

$$x^2 - 4x = 6 \Rightarrow x^2 - 4x - 6 = 0 \Rightarrow a = 1, b = -4, c = -6$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(-6)}}{2(1)} = \frac{4 \pm \sqrt{40}}{2}$$

12. (04 pts) Solve the following by **extracting square roots**: $(x-2)^2 = 16$ Solutions $x = \{-2, 6\}$

$$(x-2)^2 = 16 \Rightarrow \sqrt{(x-2)^2} = \sqrt{16} \Rightarrow x-2 = \pm 4 \Rightarrow x = 2 \pm 4$$

13. (04 pts) A rectangular piece of paper has an area of 66 in^2 . One side of the paper is 5 inches longer than the other. Find the dimensions of the paper: Length = 11 Width = 6

Area Formula: $A = LW$

$$L = W + 5$$

$$66 = (W + 5)W$$

$$0 = W^2 + 5W - 66 \Rightarrow 0 = (W - 6)(W + 11) \Rightarrow W = 6 \text{ choose positive solution.}$$

14. (04 pts) A rectangular piece of paper has an area of 63 in^2 . One side of the paper is 7 times longer than the other. Find the dimensions of the paper: Length = 21 Width = 3

Area Formula: $A = LW$

$$L = 7W$$

$$63 = (7W)W$$

$$63 = 7W^2 \Rightarrow \frac{63}{7} = W^2 \Rightarrow 9 = W^2 \Rightarrow 3 = W \text{ choose positive solution.}$$

15. (04 pts) An object is dropped from the top of an 96 ft. building. How many feet above the ground will it be 2 seconds after it is dropped? Position equation: $s = -16t^2 + v_0t + s_0$

a) 48 ft.

b) 16 ft.

c) 192 ft.

d) 32 ft.

$$\text{Position equation: } s = -16t^2 + 96 \quad \text{Plug in } t = 2: s = -16(2)^2 + 96 = 32$$

16. (04 pts) An object is dropped from the top of an 96 ft. building. How many seconds will it remain in the air before it hits the ground? Object will hit ground when $s = 0$, so set $s = 0$ and solve for t .

$$0 = -16t^2 + 96 \Rightarrow 16t^2 = 96 \Rightarrow t^2 = \frac{96}{16} \Rightarrow t = \sqrt{\frac{96}{16}} \approx 2.45 \text{ sec.}$$

17. (04 pts) Perform the indicated operation on the complex numbers (give the result in the form $a + bi$):

a) $(4 - 2i) - (2 + 6i) = 4 - 2i - 2 - 6i = 2 - 8i$

Part b is **multiplication**. Remember: $i^2 = -1$

b) $(4 - 2i)(2 + 6i) = 8 + 24i - 4i - 12i^2 = 8 - 28i - 12(-1) = 8 - 28i + 12 = 20 - 20i$