MATH 110 – Test #2 In Class Review

1. Ordered Pair in a System

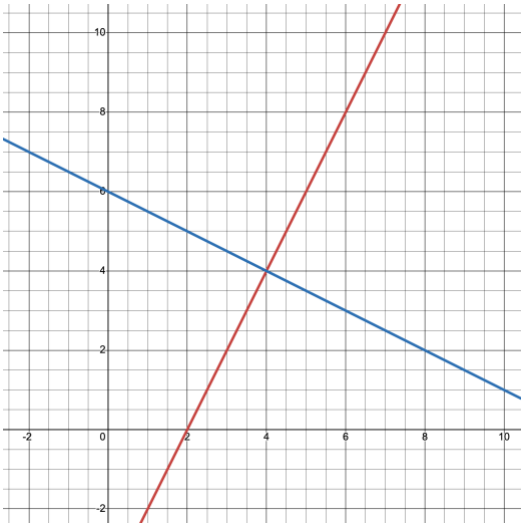
Determine whether the ordered pair (-4, 2) is a solution to the following system. Show all work.

$$x + 3y = 2$$

$$y = 2x + 7$$

2. Solution from a Graph

A system of equations is graphed. Estimate the solution as an ordered pair (x,y).



3. Candy Store Problem

Marta's Candy Shop sold 72 pounds of two kinds of jellybeans. The first type costs $4.15 per pound, the second costs $1.05 per pound. The store collected $188.10 total. Write a system of equations that models this situation. (Let x = pounds of the first kind, y = pounds of the second kind.) Do not solve.

4. Special Case in Substitution

When solving a system by substitution, you obtain the equation 0 = 7. What does this mean about the system?

5. Solve by Substitution

Solve the system using substitution. Find the value of y.

$$y = 2x - 3$$

$$3x + 4y = 10$$

6. Solve by Elimination

Solve using elimination. Find the value of y.

$$2x + y = 8$$

$$2x - y = 4$$

7. Solve System & Sum Coordinates

Solve the system:

$$2x + y = 19$$

$$x - 3y = -8$$

Write your solution as an ordered pair and then give the sum of the coordinates.

8. Charity Fruit Sale

Carlos sold boxes of apples for $12 each and boxes of pears for $9 each. He sold a total of 840 boxes and made $9,180. How many boxes of apples did he sell?

9. Matrix Dimensions

State the dimensions of the following matrix:

$$\begin{bmatrix} 7 & -2 & 4 \\ 3 & 5 & -6 \end{bmatrix}$$

10. Matrix Operation

Given $A = \begin{bmatrix} -6 & 2 \\ 4 & -3 \end{bmatrix}$, B = $\begin{bmatrix} 9 & -1 \\ 4 & 5 \end{bmatrix}$, Compute A - B.

11. Equilibrium Price

Find the equilibrium price for the demand and supply functions:

$$D(p) = 3000 - 4p$$

$$S(p) = 2400 + 6p$$

12. Profit Function

Given cost and revenue:

$$C(x) = 250x + 150{,}000$$

$$R(x) = 300x$$

Find the profit function P(x).

13. Copier Profit Problem

A company has fixed costs of $28,000, variable costs of $450 per copier, and revenue of $625 per copier. Find the profit or loss if 500 copiers are produced and sold.

14. Inequality Solution

Solve for n:

$$n - (9n - 7) \leq -8 - n$$

Give one integer solution.

15. Graphing Inequality

Graph the inequality and write the solution set in both set-builder and interval notation:

$$x > -2$$

16. Solve Linear Inequality

Solve and give answer in interval notation:

$$5(2x - 3) < 7x + 11$$

17. Translate Inequality

Translate into an inequality: "A number is AT MOST 4.25."

18. Celsius to Fahrenheit

A chemical reaction must remain stable at no more than 110.6°C. Convert this to Fahrenheit.

$F = \frac{9}{5}°C + 32$. Round to the nearest hundredth.

19. Compound Inequality

Solve and graph:

$$-4 \leq 3t + 2 \leq 11$$

20. Domain of a Function

Write the domain of $f(x) = \sqrt{x - 5}$ in interval notation.

21. Translate a Phrase

Translate into a mathematical expression: "7 less than the product of two numbers."

22. Evaluate Expression

Evaluate when a = 4, b = 6:

$$\frac{10b}{5a}$$

23. Simplify Expression

Simplify:

$$2(x - 7) - 3(x + 5)$$

24. Solve Equation

Solve for r:

$$2r - (r + 4) = 40$$

25. Slope of a Line

Find the slope of the line through the points $(-5, 3)\ and\ (7, -9)$.

Answer Key

1. Not a solution (first equation true, second false).

2. Intersection ≈ (4,4).

3. System: $x + y = 72,\ 4.15x + 1.05y = 188.10$.

4. No solution (inconsistent).

5. $y = 1$.

6. $y = 2$.

7. $(7, 5)$ sum = 12

8. 540 apples.

9. 2×3.

10. $\begin{bmatrix} 15 & 3 \\ 0 & -8 \end{bmatrix}$

11. $p = 60$

12. $P(x) = 50x - 150{,}000$

13. Profit = $59,500

14. $n \geq 15/7$

15. $\{x \mid x > -2\}, interval\ (-2, \infty)$

16. $(-\infty, \frac{26}{3})$

17. $x \leq 4.25$

18. $231.08°F$

19. $[-2,3]$

20. $[5, \infty)$

21. $xy - 7$

22. 3.

23. $-x - 29$

24. $r = 44$

25. slope = -1