

MODEL FOR A FINAL

M112F3Final

Name _____

1. Solve the following system of equations:

$$2x + 3y = 11$$

$$-(x+1) = 5y$$

$$\begin{cases} 2x + 3y = 11 & \textcircled{1} \\ -x - 5y = 1 & \textcircled{2} \end{cases}$$

$$\textcircled{1} + \textcircled{2} \times 2$$

$$2x + 3y = 11$$

$$+ \frac{-2x - 10y = 2}{-7y = 13}$$

$$-7y = 13$$

$$y = -\frac{13}{7}$$

$$-x - 5y = 1$$

$$-x - (-\frac{13}{7}) \cdot 5 = 1$$

$$-x + \frac{65}{7} = 1$$

$$-x = 1 - \frac{65}{7}$$

$$-x = -\frac{58}{7}$$

$$x = \frac{58}{7}$$

$$\therefore \begin{cases} x = \frac{58}{7} \\ y = -\frac{13}{7} \end{cases}$$

2. Solve: $10(x-3) - 2(3x-4) = 2x+3$ for x .

$$10x - 30 - 6x + 8 = 2x + 3$$

$$4x - 22 = 2x + 3$$

$$2x = 25$$

$$x = \frac{25}{2}$$

3. Solve: $\left(\frac{3x+5}{3} + 5\right) = \frac{11}{3} \cdot 3$

$$3x + 5 + 15 = 11$$

$$3x + 20 = 11$$

$$3x = -9$$

$$x = -3$$

4. Solve: $x + 3(2-x) = 6 - 2x$

$$x + 6 - 3x = 6 - 2x$$

$$6 - 2x = 6 - 2x \quad \text{True.}$$

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5. Which of the following is true?

A. $7x - 7 = 7(1 - x)$

B. $7(p - s) = (s - p) \cdot 7$

C. $5(x + Q) = (x + Q) + 5$

D. $2x + 10 = 2(x - 5)$

E. $T(c - H) = Tc - TH$

6. Write the equation of the line that contains the point $(3, -4)$ and is parallel to the line

$$y = -x - 1. \quad \text{slope} = -1 \quad \text{point: } (3, -4)$$

$$y - (-4) = -1(x - 3)$$

$$y + 4 = -x + 3$$

$$y = -x - 1$$

7. Write the equation that contains the point $(5, -5)$ and is perpendicular to the line

$$\text{containing points } (5, -3) \text{ and } (-5, 5). \quad \text{slope } \frac{5 - (-3)}{-5 - 5} = -\frac{8}{10} = -\frac{4}{5}$$

\therefore the slope of the equation that we're looking for is $-\frac{1}{(-\frac{4}{5})} = \frac{5}{4}$, point $(5, -5)$

$$y - (-5) = \frac{5}{4}(x - 5)$$

$$y + 5 = \frac{5}{4}x - \frac{25}{4}$$

$$y = \frac{5}{4}x - \frac{25}{4} - 5$$

$$y = \frac{5}{4}x - \frac{45}{4}$$

8. Write an equation of the line containing the given pair of points $(2, -4), (-5, 3)$.

$$\text{slope: } \frac{3 - (-4)}{-5 - 2} = \frac{7}{-7} = -1$$

$$y = -x + b \quad (2, -4)$$

$$-4 = -(2) + b$$

$$b = -2$$

$$\therefore y = -x - 2$$

9. Find the slope of the line $9x - 6y = 4$.

$$-6y = -9x + 4$$

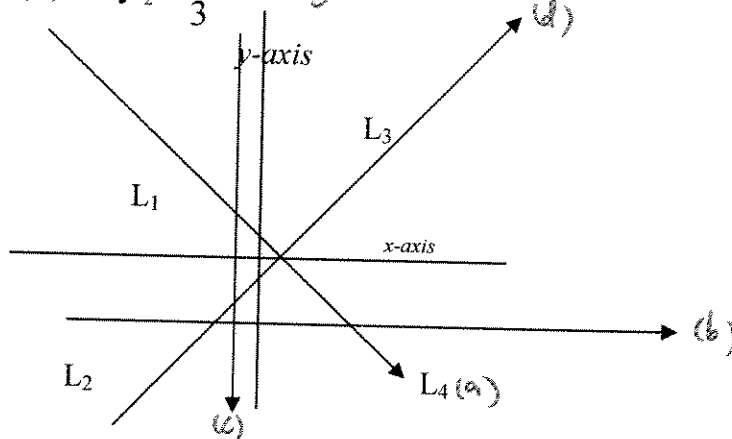
$$y = \frac{-9}{-6}x + \frac{4}{-6}$$

$$\therefore \text{slope} = -\frac{9}{-6} = \boxed{\frac{3}{2}}$$

10. Match the equation of the lines with L_1, L_2, L_3, L_4 in the graph.

(a) $y_1 = -\frac{5}{7}x + 12$ ↘ (b) $y_4 = -11$ ↔ (c) $X = -2$ ↕

(d) $y_2 = \frac{4}{3}x - 6$ ↗



11. The Nuttery has 11 pounds of mixed cashews and pecans worth \$9.40 per pound. Cashews sell for \$9.00 per pound and pecans sell for \$10.00 per pound. How many pounds of pecans are in the mix?

$$9(11-x) + 10 \cdot x = 11 \cdot 9.4$$

	lbs	price	\$
C	$11-x$	9	$9(11-x)$
P	x	10	$10x$
Tot	11	9.4	$11 \cdot 9.4$

12. The weight that can be lifted by an automobile jack varies directly with the force exerted downward on the jack handle. If a force of 9 pounds will lift 954 pounds, what weight will be lifted by a force of 15 pounds?

$$y = k \cdot x$$

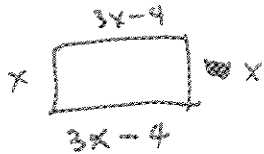
$$954 = k \cdot 9$$

$$k = 106$$

$$\therefore y = 106 \cdot x \quad \text{if } x = 15$$

$$y = 106 \cdot 15 = 1590 \text{ lbs.}$$

13. The perimeter of a rectangle is 32 meters. The length is 4 meters less than 3 times the width. What are the dimensions of the rectangle.



$$2 \cdot x + 2 \cdot (3x - 4) = 32$$

$$\therefore x = 5, \quad 3x - 4 = 11$$

\therefore width is 5m, length is 11m.

14. In a triangle, angle B is 5° less than 3 times angle A. Angle C is 6° more than the sum of the other two angles.

$$\begin{cases} B = 3A - 5 \\ C = 6 + A + B \\ A + B + C = 180 \end{cases}$$

$$\begin{cases} -3A + B = -5 \\ -A + B + C = 6 \\ A + B + C = 180 \end{cases}$$

$$\begin{bmatrix} -3 & 1 & 0 & -5 \\ -1 & -1 & 1 & 6 \\ 1 & 1 & 1 & 180 \end{bmatrix}$$

Solve the matrix or by hand.

Determine the sizes of the

three angles. Choose the value of x which satisfies the equation $|2x + 2| = 3$.

- (a) $\frac{1}{2}$ (b) $-\frac{5}{2}$ (c) $\frac{1}{2}$ and $-\frac{5}{2}$ (d) 1 and $\frac{1}{2}$

- (e) none of the above.

$$|2x + 2| = 3$$

$$2x + 2 = 3 \quad \text{or} \quad 2x + 2 = -3$$

$$2x = 1 \quad \text{or} \quad 2x = -5$$

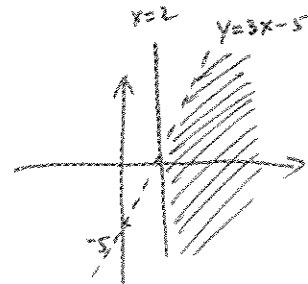
$$x = \frac{1}{2}$$

$$x = -\frac{5}{2}$$

15. In the equation $E = IR$ solve for I .

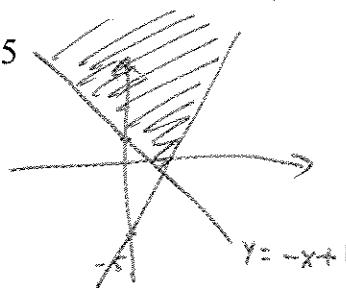
$$I = \frac{E}{R}$$

16. Graph the inequality: $x \geq 2, y < 3x - 5$.



17. Graph the solution of: $\begin{cases} x + y \geq 1 \\ 2x - y \leq 5 \end{cases}$

$$\begin{cases} y \geq -x + 1 \\ y \geq 2x - 5 \end{cases}$$



18. Solve the compound inequality $-4 < 2x - 6 < 10$

$$\begin{array}{ccc} & +6 & +6 \\ -4 & < & 2x - 6 < & 10 \end{array}$$

$$\frac{2}{2} < \frac{2x}{2} < \frac{16}{2}$$

$$1 < x < 8$$

19. Solve: $\left(-\frac{2}{3}(x-4)\right) \leq \left(\frac{2x-3}{-4}\right) - 12$

$$8(x-4) \geq (2x-3) \cdot 3$$

$$8x - 32 \geq 6x - 9$$

$$2x \geq 23$$

$x \geq \frac{23}{2}$

20. Suppose that the equation of line L_1 is $4y + 1 = 5 - 12x$. What is the slope of a line perpendicular to L_1 .

$$4y + 1 = 5 - 12x$$

$$4y = -12x - 4$$

$$y = -3x - 1$$

slope = -3

if \perp to this

$$-\frac{1}{(-3)} = \frac{1}{3}$$

$\frac{1}{3}$

21. Suppose that the equation of line L_1 is $4x + 5y = -2$. What is the slope of a line parallel to L_1 .

$$5y = -4x - 2$$

$$y = -\frac{4}{5}x - \frac{2}{5}$$

same slope if //

$$\therefore \frac{-4}{5}$$

$\frac{-4}{5}$

22. Study the sheet where you had to find the inequalities for the given solutions.