

Practice Part 2 Questions for Final.

- 1) Solve the following system of equations graphically. Show all work. Label the graph properly. CHECK your solution.

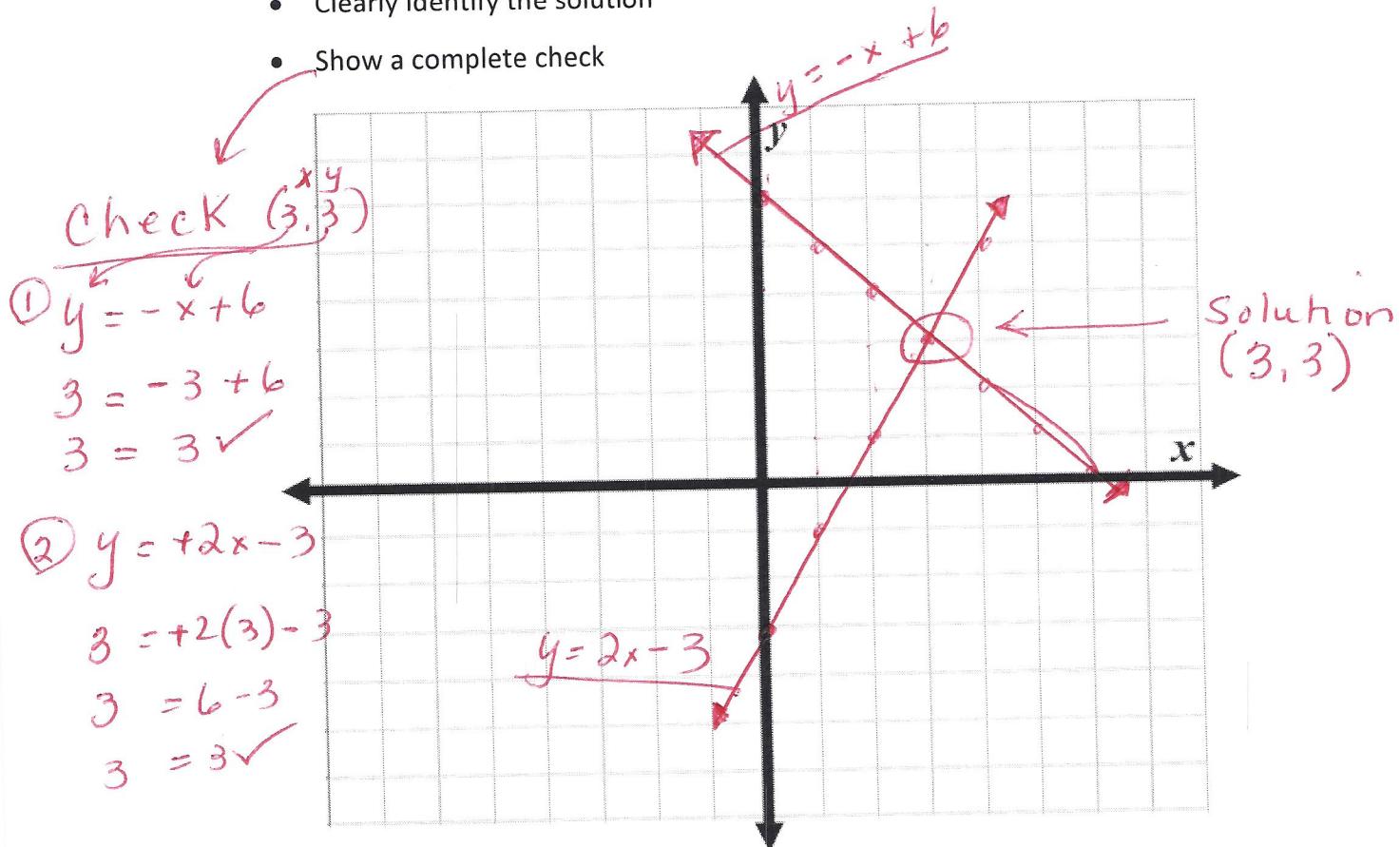
$$M: \frac{-1}{1} \\ B: 6 \quad (0, 6)$$

$$\leftarrow y = -x + 6 \\ y = 2x - 3 \rightarrow$$

$$M: \frac{2}{1} \\ B: -3 \quad (0, -3)$$

Be sure to:

- Graph the lines
- Clearly identify the solution
- Show a complete check



2) Graph the following linear function and graph the line on the grid provided.

Slope: $\frac{2}{5}$

Y-intercept: 2 (0, 2)

~~$-2x + 5y = 10$~~

~~$\frac{1}{5}x$~~

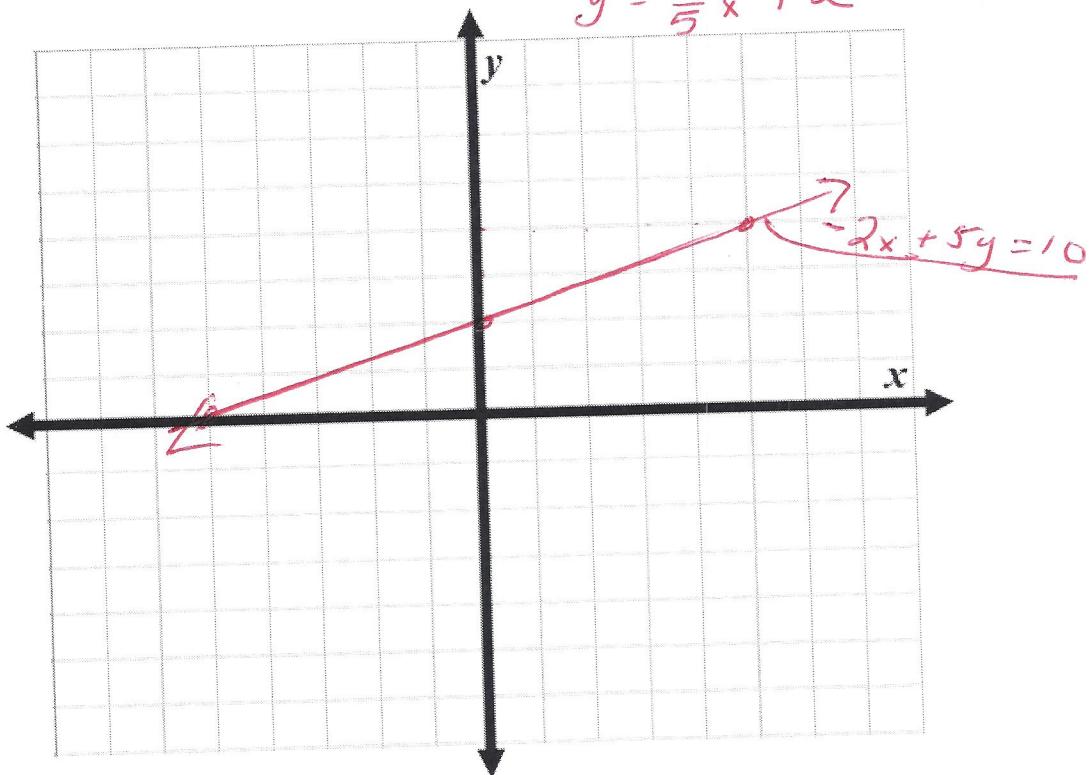
~~$+2x$~~

~~$\frac{5}{5}y = \frac{2}{5}x + 10$~~

$y = \frac{2}{5}x + 2$

Hint: Put equation into

$y = mx + b$ form



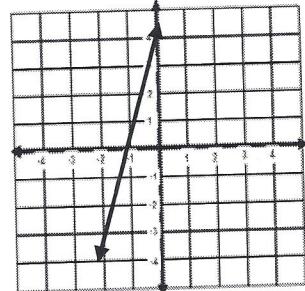
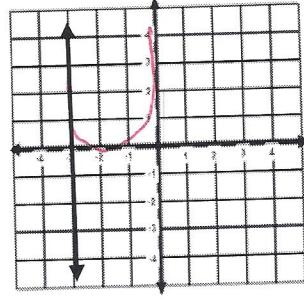
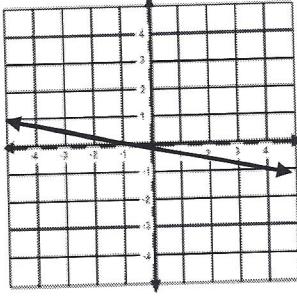
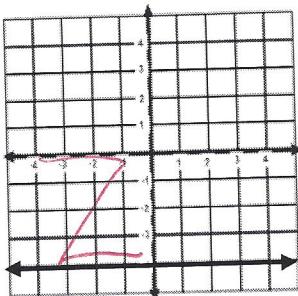
Identify the slope in each figure below.

Zero

Negative

Undefined

Positive



Equation
begins
 $y = \#$

↑
Only equation
that begins
 $x = \#$
NOT A FUNCTION

3) Graph the following on the one grid below.

A) Graph the image of the $ABCD$ after a counter clockwise rotation of 90° .

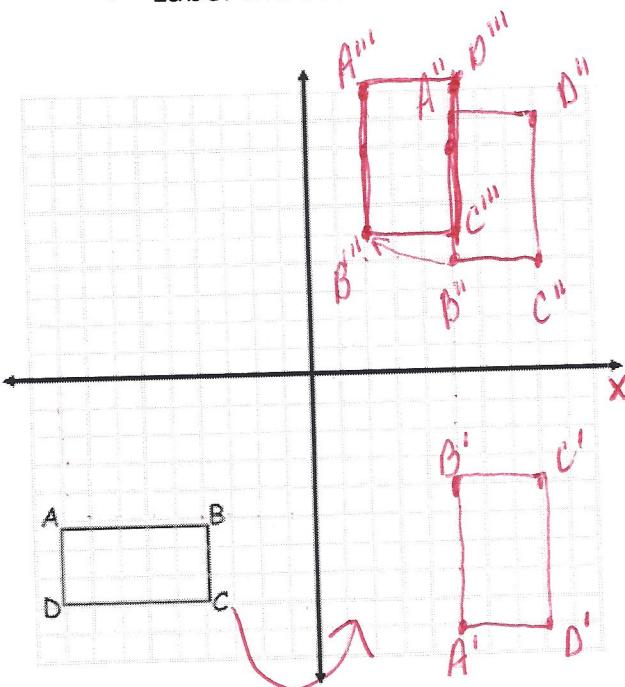
- Name the vertices of $A'B'C'D'$.
- Label the coordinates of the vertices of $A'B'C'D'$.

B) Graph the image of $A'B'C'D'$ after a reflection over the x -axis.

- Name the vertices of $A''B''C''D''$. *reflect over x, X stays same*
- Label the coordinates of the vertices of $A''B''C''D''$.

C) Graph the image of $A''B''C''D''$ after a translation of $T_{(-3,1)}^{xy}$

- Name the vertices of $A'''B'''C'''D'''$. *subtract 3 from x add 1 to y*
- Label the **coordinates** of the vertices of $A'''B'''C'''D'''$.



$$\begin{aligned}
 A(-9, -5) &\xrightarrow{R_{90^\circ}} A'(-5, -9) \xrightarrow{\text{r } x\text{-axis}} A''(-5, -3) \xrightarrow{T_{-3,1}} A'''(5, 10) \\
 B(-4, -5) &\longrightarrow B'(-5, -4) \longrightarrow B''(-3, -3) \longrightarrow B'''(2, 5) \\
 C(-4, -8) &\longrightarrow C'(-8, -4) \longrightarrow C''(-3, -1) \longrightarrow C'''(5, 5) \\
 D(-9, -8) &\longrightarrow D'(-8, -9) \longrightarrow D''(-3, -1) \longrightarrow D'''(5, 10)
 \end{aligned}$$

Flip Flop
x stay
Turn paper
if needed

4) Determine the linear equation for the set of data represented below.

Δx	x	y
+1	-1	8
+1	0	6
+2	1	4
+3	3	0
+5	5	-4
+6	6	-6

Δy

) -2

) -4

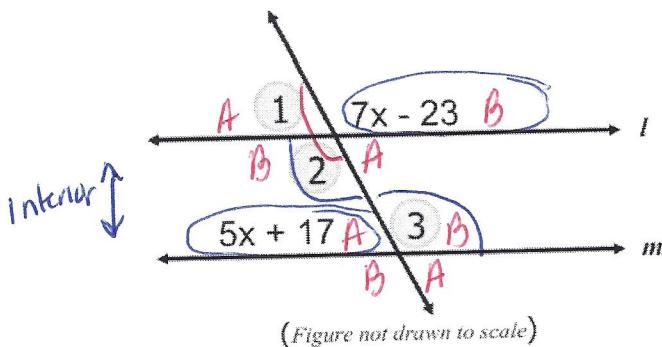
Equation: $y = -\frac{2}{1}x + 6$

HINT: $y = mx + b$

slope (m) = $\frac{\Delta y}{\Delta x}$ $\frac{-4}{2} = -2$

y-intercept (b) = 6 $(0, 6)$
(when $x=0$, $y=b$)

5) In the figure below, lines l and m are parallel.



(and adjacent)

- a) Name the angle relationship between: $\angle 1$ and $\angle 2$, Supplementary
 $\angle 2$ and $\angle 3$, Alternate interior

b) Find x . Set up an equation and solve. Show work.

$$\begin{aligned} \text{Cloud 1: } & \angle A + \angle B = 180 \\ \text{Cloud 2: } & 7x - 23 + 5x + 17 = 180 \\ & 12x - 6 + 6 = 180 \\ & 12x = 186 \\ & \frac{12x}{12} = \frac{186}{12} \\ & x = 15.5 \end{aligned}$$

c) What is the angle measurement for $\angle 3$?

Explain your answer.

$\angle 3$ is "B" so $= 7x - 23$

$$\begin{aligned} & 7(15.5) - 23 = \\ & 108.5 - 23 = 85.5 \end{aligned}$$

use calculator
Set fraction in ()

6) Solve each and check.

a. $\frac{1}{3}(15x - 12) + 2x = \frac{-2}{5}(10x + 30) - 3$

$(5x) - 4 + 2x = -4x - 12 - 3$

$$\begin{array}{r} 7x - 4 = -4x - 15 \\ + 4x \\ \hline 11x = -11 \end{array}$$

$$\begin{array}{r} 11x = -11 \\ + 4 \\ \hline 11x = -11 \end{array}$$

$x = -1$

Check

$$\frac{1}{3}(15(-1) - 12) + 2(-1) = \frac{-2}{5}(10(-1) + 30) - 3$$

$$\frac{1}{3}(-15 - 12) - 2 = -\frac{2}{5}(-10 + 30) - 3$$

$$\frac{1}{3}(-27) - 2 = -\frac{2}{5}(20) - 3$$

b. $\frac{1}{8}x + \frac{3}{2} = \frac{1}{4}x + 2$

$$-9 - 2 = -8 - 3$$

$$-11 = -11$$

Same sign

"Add & keep sign"

Method 1 \checkmark
clear fractions

$$8\left(\frac{1}{8}x\right) + 8\left(\frac{3}{2}\right) = 8\left(\frac{1}{4}x\right) + 8(2)$$

- Find Common
Denominator
= multiply

$$\cancel{x} + 12 = 2x + 16$$

$$-14$$

$$12 = 1x + 16$$

$$-16$$

$$-4 = x$$

Check

$$\frac{1}{8}(-4) + \frac{3}{2} = \frac{1}{4}(-4) + 2$$

Method 2 \checkmark (use calculator
to +, - x ÷
fractions,

$$\begin{array}{r} \cancel{\frac{1}{8}x} + \frac{3}{2} = \frac{1}{4}x + 2 \\ - \cancel{\frac{1}{8}x} \\ \hline \frac{3}{2} = \frac{1}{4}x + 2 \end{array}$$

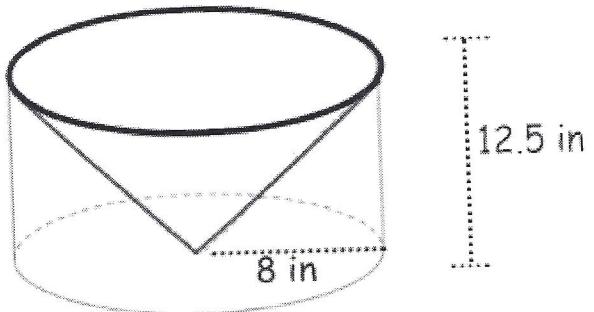
$$\begin{array}{r} -2 \\ \hline -\frac{1}{2} = \frac{1}{8}x \end{array}$$

$$\begin{array}{r} \frac{1}{8} \\ \hline \frac{1}{8} = \frac{1}{8} \end{array}$$

$$-4 = x$$

- 7) a. A solid cone, with a radius of 8 in., is placed inside of a 12.5 in high cylindrical water jug of the same radius. How many cubic inches of water will the jug now hold with the solid cone inside of it?

$$V = \pi r^2 h$$



$$\text{Volume cylinder: } \pi 8^2 \cdot 12.5$$

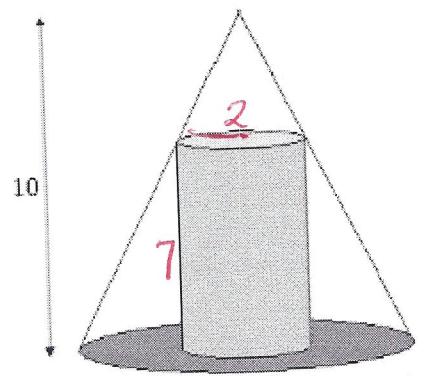
$$800\pi$$

$$V = \frac{\pi r^2 h}{3}$$

$$\text{Volume cone: } \frac{\pi 8^2 \cdot 12.5}{3} = \frac{800\pi}{3}$$

$$\text{Empty Space: } 800\pi - \frac{800\pi}{3} = 1675.5 \text{ in}^3$$

- b. A solid cylinder is placed in the cone to the right. The cylinder has a radius of 2 and a height of 7. How much volume is left in the cone if the dimensions are all in meters?



$$\text{Volume cylinder: } \frac{\pi r^2 h}{3} = \pi 2^2 \cdot 7$$

$$28\pi$$

$$\text{Volume cone: } \frac{\pi r^2 h}{3} = \frac{\pi 4^2 \cdot 10}{3} = \frac{160\pi}{3}$$

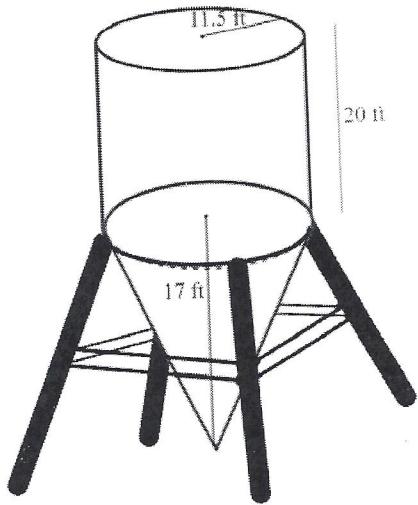
$$\text{Empty Space} \rightarrow \text{Cone} - \text{Cylinder}$$

$$\frac{160\pi}{3} - 28\pi = 79.59 \text{ units}^3$$

C: Fanny Farmer purchased a new silo which will be filled with grain. The silo consists of a cylinder top and conical bottom. How many cubic feet of grain can the silo hold?

$$\text{Volume of cylinder: } V = \pi r^2 h = \pi 11.5^2 \cdot 20 = 2645\pi$$

$$\text{Volume of cone: } V = \frac{\pi r^2 h}{3} = \frac{\pi 11.5^2 \cdot 17}{3} = \frac{2248.25\pi}{3}$$



$$\text{Volume of silo: } \text{volume of cylinder} + \text{volume of cone} \\ 2645\pi + \frac{2248.25\pi}{3} = 10663.87 \text{ ft}^3$$

8) a) Solve for x:

$$\sqrt{x-4} + 2 = 12$$

$$\begin{array}{r} -2 \\ -2 \end{array}$$

$$\underline{(x-4)}^2 = (10)^2$$

$$x-4 = 100$$

$$\begin{array}{r} +4 \\ +4 \end{array}$$

$$\underline{x = 104}$$

a. 104

- Isolate \sqrt{x}
- Solve by squaring

b) Solve for x:

$$\frac{x^2}{2} - 5 = 3$$

$$\begin{array}{r} +5 \\ +5 \end{array}$$

$$\underline{x^2 = 16}$$

$$\sqrt{x^2} = \pm 4$$

b. ± 4

- Isolate x^2
- Solve by taking square root

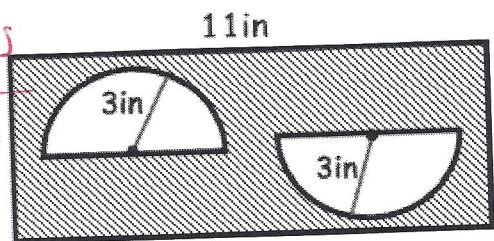
9. Find the area of the shaded region. Write a description of your strategy for solving the problem first. Show all work. Give both the exact answer, and to the nearest tenth.

$$\text{Area of Shaded} = \text{Area of rectangle} - \text{Area of 2 semicircles}$$

$$\text{Area rectangle} = l \cdot w = 5 \cdot 11 = 55$$

$$\text{Area of circle} = \pi r^2 = \pi 3^2 = 9\pi$$

$2 \text{ semis} = 1 \text{ whole circle}$



Exact: $55 - 9\pi$

Nearest tenth: $26.72 = 26.7 \text{ in}^2$