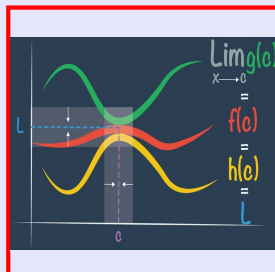


Math 261

Fall 2023

Lecture 1



Some Math Review:

1) Simplify $2(2x-5) - 5(x-2)$

$$= 4x - 10 - 5x + 10$$

$$= \boxed{-x}$$

1) $-x$

2) Solve $\frac{1}{2}x - \frac{1}{3} = \frac{1}{4}x + \frac{5}{6}$

$LCD = 12$

$$12 \cdot \frac{1}{2}x - 12 \cdot \frac{1}{3} = 12 \cdot \frac{1}{4}x + 12 \cdot \frac{5}{6}$$

$$6x - 4 = 3x + 10$$

$$6x - 3x = 10 + 4$$

$$3x = 14$$

$$\boxed{x = \frac{14}{3}}$$

Solution Set

2) $\left\{\frac{14}{3}\right\}$

3) Solve $-2 < 3x + 4 \leq 13$, Express final Answer in interval notation.

$$\begin{aligned} -2 - 4 < 3x \leq 13 - 4 \\ -6 < 3x \leq 9 \end{aligned}$$

→ Divide by 3

$$-\frac{6}{3} < x \leq \frac{9}{3}$$

$$-2 < x \leq 3$$



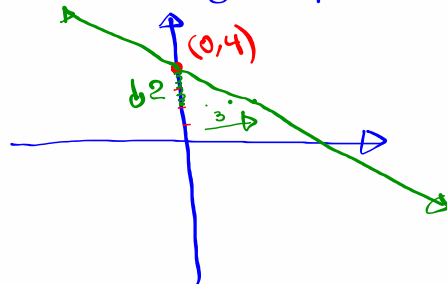
$$\Rightarrow (-2, 3]$$

4) Graph $y = -\frac{2}{3}x + 4$

$$y = mx + b$$

Slope-Int. form

$$m = -\frac{2}{3} \text{ slope, } y\text{-Int } (0, 4)$$



$$m = \frac{\text{Rise}}{\text{Run}} = -\frac{2}{3}$$

5) Factor completely:

$$a) \quad 4x - 100 = 4x - 4 \cdot 25 = \boxed{4(x - 25)}$$

$$a) \quad \underline{4(x - 25)}$$

$$b) \quad 4x^2 - 100x = 4 \cdot x \cdot x - 4 \cdot 25 \cdot x$$

$$= \boxed{4x(x - 25)}$$

$$b) \quad \underline{4x(x - 25)}$$

$$c) \quad 4x^2 - 100$$

$$= 4(x^2 - 25) = 4(x^2 - 5^2) = \boxed{4(x + 5)(x - 5)}$$

$$\text{Recall } A^2 - B^2 = (A + B)(A - B)$$

$$c) \quad \underline{4(x + 5)(x - 5)}$$

6) Factor completely:

$$a) x^2 + 6x + 5 = (x + 1)(x + 5)$$

$$a) \underline{(x+1)(x+5)}$$

$$b) x^2 - 2x - 8 = (x + 2)(x - 4)$$

$$b) \underline{(x+2)(x-4)}$$

$$c) 3x^2 - 5x - 8 = 3x^2 + 3x - 8x - 8$$

$$= 3x(x+1) - 8(x+1)$$

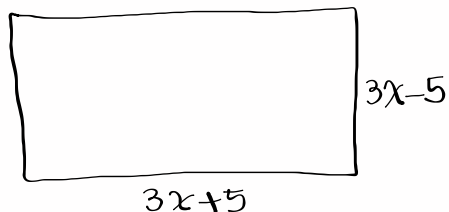
$$= (x+1)(3x-8)$$

Product: -24
Sum: -5

1, -24
2, -12
3, -8
4, -6

$$c) \underline{(x+1)(3x-8)}$$

Find the area & perimeter for the rectangle below:



$$A = LW$$

$$= (3x+5)(3x-5)$$

$$= 9x^2 - 15x + 15x - 25$$

$$= \boxed{9x^2 - 25}$$

$$P = 2L + 2W$$

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

$$= 6x + 10 + 6x - 10$$

$$= \boxed{12x}$$

$$\text{Area} \rightarrow 9x^2 - 25$$

$$\text{Perimeter} \rightarrow 12x$$

Graph $5x - 2y = -10$

x	y
0	5
-2	0

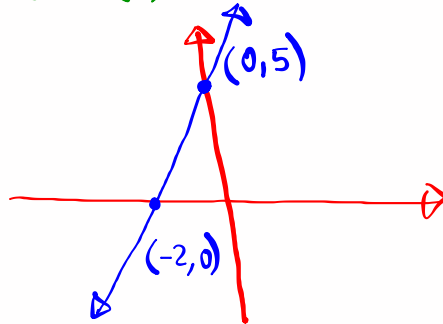
Intercept
Method

$$5(0) - 2y = -10$$

$$0 - 2y = -10 \quad y = 5$$

$$5x - 2(0) = -10$$

$$5x - 0 = -10 \quad x = -2$$



Class QZ 1

Solve $3x^2 - 5x - 8 = 0$ by quadratic formula.

Express Final Answer in
Solution Set.

$$ax^2 + bx + c = 0$$

$$\rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Make Sure to box

$$a = 3, b = -5, c = -8$$

Your final answer.

$$b^2 - 4ac = (-5)^2 - 4(3)(-8) = 25 + 96 = 121$$

$$x = \frac{-(-5) \pm \sqrt{121}}{2(3)} = \frac{5 \pm 11}{6}$$

$$\rightarrow x = \frac{5+11}{6} = \frac{16}{6} = \frac{8}{3}$$

$$\rightarrow x = \frac{5-11}{6} = \frac{-6}{6} = -1$$

$$\boxed{\left\{-1, \frac{8}{3}\right\}}$$