

Math 261

Spring 2023

Lecture 2



Feb 19-8:47 AM

More algebra review

$$\begin{array}{|l} \boxed{} \\ 2x-3 \end{array} \quad 4x^2+6x+9$$

$$P = 2L + 2W = 2(2x-3) + 2(4x^2+6x+9)$$

$$= 4x - 6 + 8x^2 + 12x + 18$$

$$= \boxed{8x^2 + 16x + 12}$$

a)

$$A = LW = (2x-3)(4x^2+6x+9)$$

$$= 8x^3 + 12x^2 + 18x - 12x^2 - 18x - 27$$

$$= \boxed{8x^3 - 27}$$

b)

Feb 7-8:47 AM

Use Quadratic Formula to Solve

$$(3x - 2)(x + 4) = -8$$

$$3x^2 + 12x - 2x - 8 = -8$$

$$3x^2 + 10x - 8 + 8 = 0$$

$$3x^2 + 10x = 0$$

$$a=3$$

$$b=10$$

$$c=0$$

$$b^2 - 4ac = 10^2 - 4(3)(0) = 100$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-10 \pm \sqrt{100}}{6} = \frac{-10 \pm 10}{6}$$

Solution

Set

$$x = \frac{-10 + 10}{6} = \frac{0}{6} = 0$$

$$x = \frac{-10 - 10}{6} = \frac{-20}{6} = \frac{-10}{3}$$

$$4) \left\{ \frac{-10}{3}, 0 \right\}$$

Feb 7-8:52 AM

Solve $2 \sin^2 x + \sin x - 1 = 0$ in $[0, 2\pi)$.

Let $Y = \sin x$

$$2Y^2 + Y - 1 = 0$$

$$(2Y - 1)(Y + 1) = 0$$

$$2Y - 1 = 0 \quad Y + 1 = 0$$

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

$$Y = -1$$

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

$$\text{R.A. } \frac{\pi}{6}$$

$$\sin x = -1$$

$$x = \frac{3\pi}{2}$$

$$\text{QI } x = \frac{\pi}{6}$$

$$\text{QII } x = \pi - \frac{\pi}{6} = \frac{5\pi}{6}$$

$$5) \left\{ \frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2} \right\}$$

Feb 7-8:56 AM

Consider $(x-2)^2 + y^2 = 4$

1) What do you know?

Circle, Center $(2,0)$, Radius 2

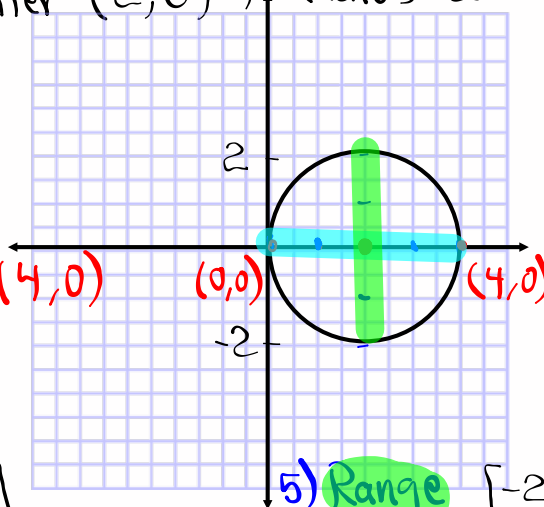
2) Draw it.

3) x-Ints $(0,0), (4,0)$

y-Ints $(0,0)$

4) Domain $[0,4]$

5) Range $[-2,2]$



Feb 7-9:01 AM

$$3|x| - 2|y| = 6$$

Graph it.

QI: $x > 0, y > 0$

$$|x| = x, |y| = y$$

$$3x - 2y = 6$$

$$\begin{array}{r|l} x & y \\ \hline 0 & -3 \\ 2 & 0 \end{array}$$

QII: $x < 0, y > 0$

$$|x| = -x, |y| = y$$

$$-3x - 2y = 6$$

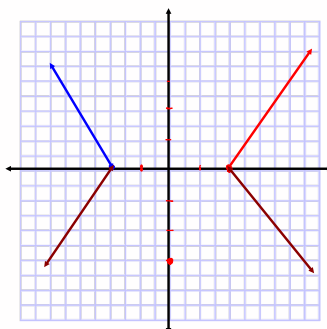
$$\begin{array}{r|l} x & y \\ \hline 0 & -3 \\ -2 & 0 \end{array}$$

QIV

$x > 0, y < 0$

$$|x| = x, |y| = -y$$

$$3x + 2y = 6$$



QIII: $x < 0, y < 0$

$$|x| = -x, |y| = -y$$

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

$$\begin{array}{r|l} x & y \\ \hline 0 & 3 \\ -2 & 0 \end{array}$$

Feb 7-9:06 AM

$$f(x) = 4x - 6$$

find $\frac{f(x+h) - f(x)}{h}$, then evaluate for $h=0$

$$\frac{4(x+h) - 6 - (4x - 6)}{h} = \frac{\cancel{4x} + 4h - \cancel{6} - \cancel{4x} + \cancel{6}}{h} = \frac{\cancel{4h}}{\cancel{h}} = \boxed{4}$$

Feb 7-9:18 AM

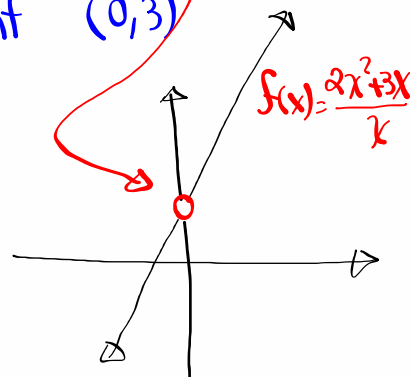
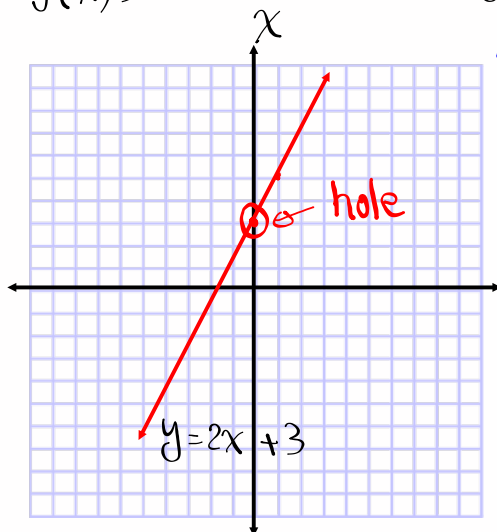
Graph $f(x) = \frac{2x^2 + 3x}{x}$; $x \neq 0$

$$f(x) = \frac{x(2x+3)}{x}$$

$$f(x) = 2x + 3$$

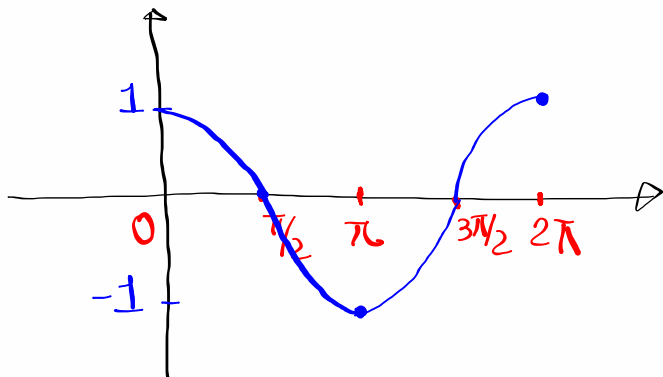
$$m = 2 = \frac{2}{1}$$

Y-Int (0,3)



Feb 7-9:23 AM

Graph $f(x) = \cos x$ on $[0, 2\pi]$

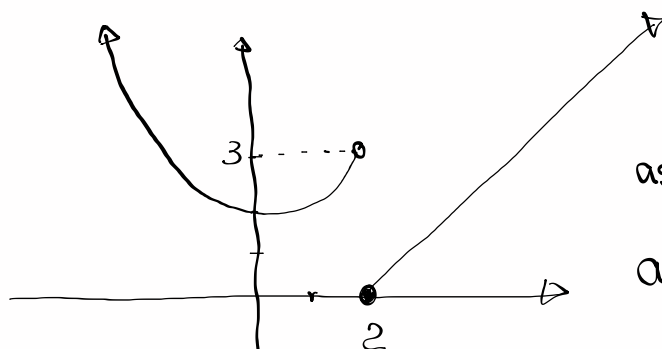


as $x \rightarrow \pi^+$, $y \rightarrow -1$

as $x \rightarrow \pi^-$, $y \rightarrow -1$

Feb 7-9:28 AM

Consider the graph below:



as $x \rightarrow 2^+$, $y \rightarrow 0$

as $x \rightarrow 2^-$, $y \rightarrow 3$

Syllabus is updated.

Read it, sign, date last page
only along with Your Picture ID.

Feb 7-9:31 AM