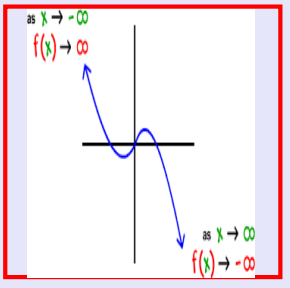
Math 245

Spring 2022

Lecture 8



Class Qz 3

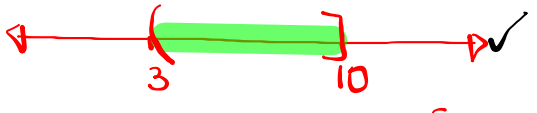
Solve $-1 < 2x - 7 \leq 13$

Express final answer in graphing, interval notation, and Set-Builder notation.

$-1+7 < 2x \leq 13+7$

$6 < 2x \leq 20$

$3 < x \leq 10$ ✓



I.N. ✓ $(3, 10]$ ✓ S.B.N. $\{x \mid 3 < x \leq 10\}$

Such that

Solve $|5x-2|+3<10$

$|5x-2|<7$

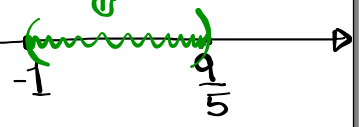
shade inside

Solve $|5x-2|=7$

$5x-2=7$ OR $5x-2=-7$

$5x=9$ $\quad 5x=-5$

$x=\frac{9}{5}$ $\quad x=-1$



I.N. $(-1, \frac{9}{5})$

S.B.N. $\{x \mid -1<x<\frac{9}{5}\}$

Solve $-4|x+3|-2\leq -18$

$-4|x+3|\leq -16$

$\frac{-4}{-4}|x+3|\geq\frac{-16}{-4}$

$|x+3|\geq 4$

shade outside

union

I.N. $(-\infty,-7]\cup[1,\infty)$

Solve $|x+3|=4$

$x+3=4$ $\quad x+3=-4$

$x=1$ $\quad x=-7$

S.B.N. $\{x \mid x\leq -7 \text{ OR } x\geq 1\}$

Simplify $\frac{2}{3} - \frac{1}{4}$

LCD = 12

$= \frac{2 \cdot 4}{3 \cdot 4} - \frac{1 \cdot 3}{4 \cdot 3} = \frac{8}{12} - \frac{3}{12} = \frac{8-3}{12}$

$= \boxed{\frac{5}{12}}$

Simplify $\frac{2}{x-3} - \frac{1}{x+4}$

LCD $= (x-3)(x+4)$

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

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

$= \boxed{\frac{x+11}{(x-3)(x+4)}}$

Simplify $\frac{x}{x^2-6x+5} - \frac{4}{x^2-1}$

$= \frac{x(x+1)}{(x-1)(x-5)(x+1)} - \frac{4(x-5)}{(x+1)(x-1)(x-5)}$

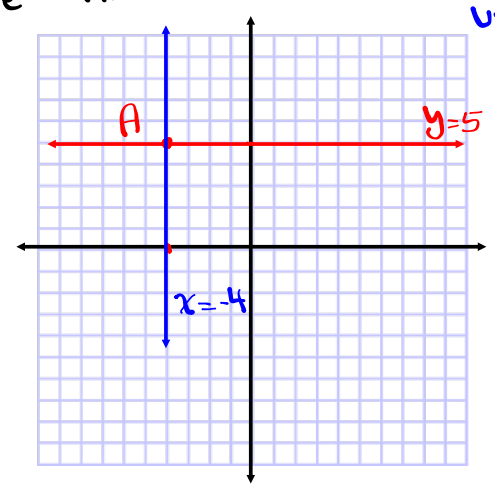
$= \frac{x(x+1) - 4(x-5)}{(x-1)(x-5)(x+1)} = \frac{x^2+x-4x+20}{(x-1)(x-5)(x+1)}$

$= \boxed{\frac{x^2-3x+20}{(x-1)(x-5)(x+1)}}$

Given A(-4, 5)

1) Draw a line that contains A with Zero Slope.
H.L. → y=5

2) Draw a line that contains A with No Slope.
Undefined Slope
V.L. → x=-4



SG 2 ✓

No School Monday

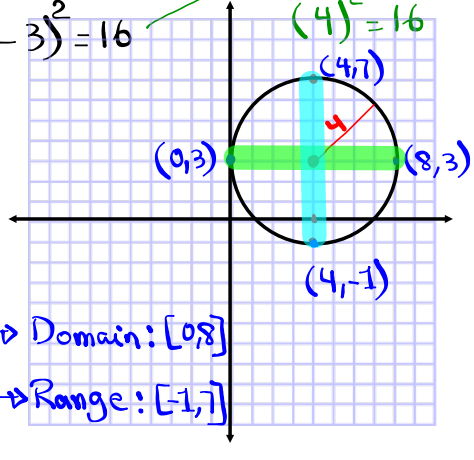
Circle

1) Center (h, K)

2) Radius r

3) Equation $(x-h)^2+(y-K)^2=r^2$

Ex: $(x-4)^2+(y-3)^2=16$ → $r^2=16$, $(4)^2=16$



Center (4, 3)

Radius r=4

x-values → Domain: [0,8]

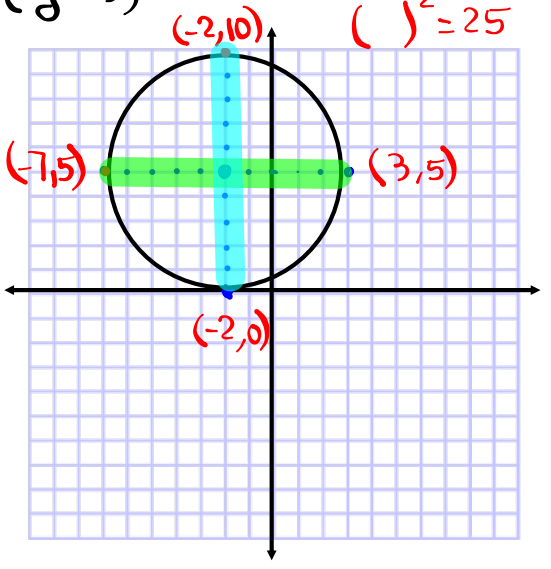
Y-values → Range: [-1,7]

Given $(x+2)^2 + (y-5)^2 = 25$ $\quad r^2 = 25$ $\quad (\ )^2 = 25$

1) Center $(-2, 5)$

2) Radius $r = 5$

3) Draw



4) Domain : $[-7, 3]$

5) Range : $[0, 10]$

Given $y = |2x - 3| - 5$

1) Find the y-Int

Let $x = 0$

Find y

$y = |2(0) - 3| - 5$

$= |-3| - 5$

$= 3 - 5 = -2$

$(0, -2)$

2) Find all x-Ints

Let $y = 0$

Find x

$y = |2x - 3| - 5$

$|2x - 3| - 5 = 0$

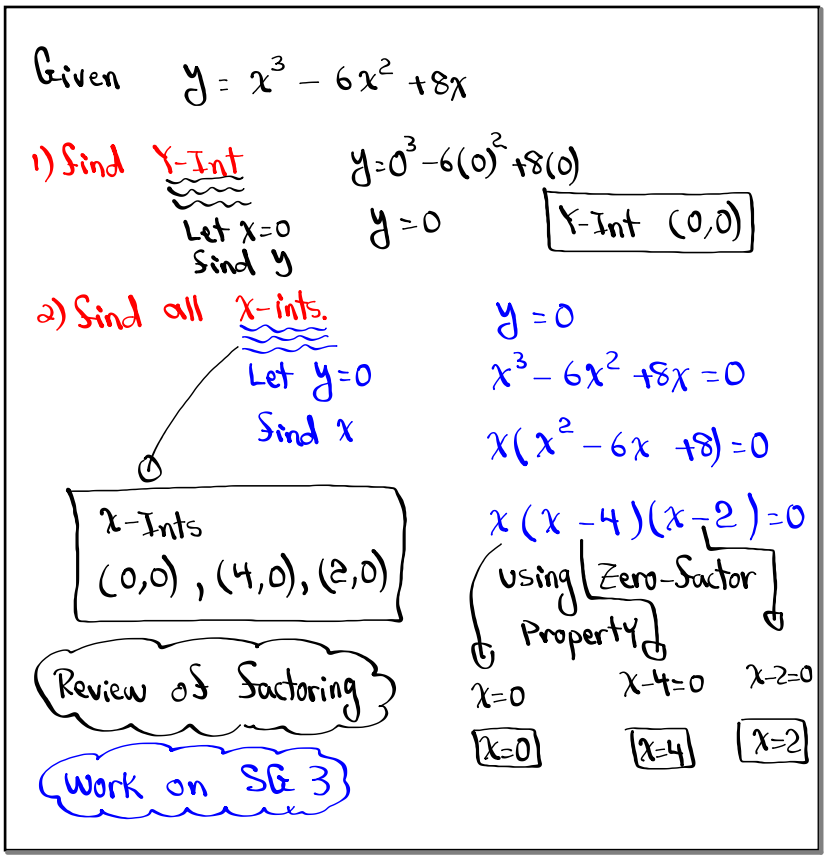
$|2x - 3| = 5$

$2x - 3 = 5$ OR $2x - 3 = -5$

$2x = 8$ $\qquad 2x = -2$

$x = 4$ $\qquad x = -1$

$(4, 0), (-1, 0)$


Given $y = x^3 - 6x^2 + 8x$
1) Find Y-Int
Let $x=0$
Find y
$y = 0^3 - 6(0)^2 + 8(0)$
$y = 0$
Y-Int (0,0)
2) Find all x-ints.
Let $y=0$
Find x
$y = 0$
$x^3 - 6x^2 + 8x = 0$
$x(x^2 - 6x + 8) = 0$
$x(x-4)(x-2) = 0$
using Zero-Factor Property
$x=0$
$x-4=0$
$x-2=0$
x-Ints
(0,0), (4,0), (2,0)
$x=0$
$x=4$
$x=2$
Review of Factoring
Work on SG 3