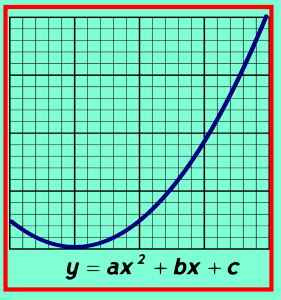
# Math 125

# Fall 2021

# Lecture 3




Class Qz 1

1) Simplify $\dfrac{\sqrt{5^2-(-3)^2}}{\sqrt{16}} = \dfrac{\sqrt{25-9}}{4} = \dfrac{\sqrt{16}}{4} = \dfrac{4}{4} = \boxed{1}$

2) Solve: $3(x+1)-10=-7$

$3x+3-10=-7$

$3x-7=-7$

$3x=-7+7$

$3x=0$

$x=\dfrac{0}{3}$ $\boxed{x=0}$ $\{0\}$

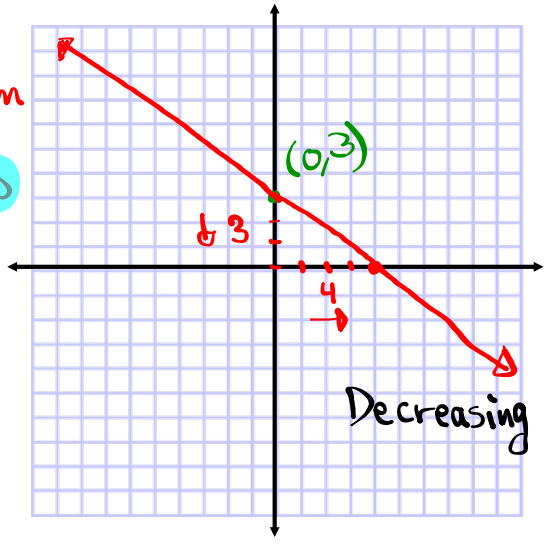
Graph $y = \frac{-3}{4}x + 3$

Slope-Int Form

$y = mx + b$

Slope $m = \frac{-3}{4}$ $\frac{\text{Rise}}{\text{Run}}$

Y-Int $(0, 3)$

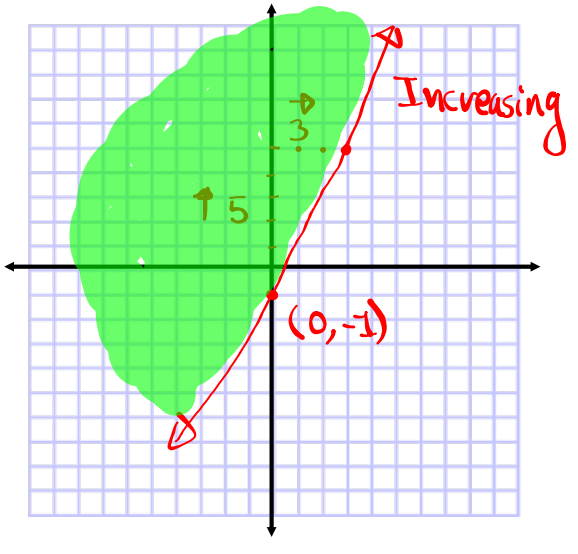



Graph $y = \frac{5}{3}x - 1$, and shade above it.

$y = mx + b$

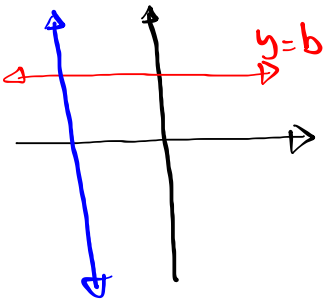
Slope $m = \frac{5}{3}$ $\frac{\text{Rise}}{\text{Run}}$

Y-Int $(0, -1)$



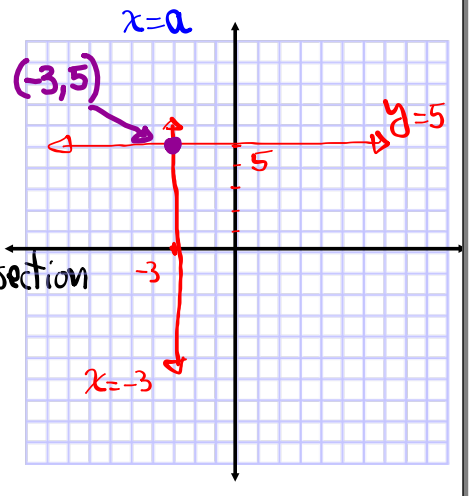
Special lines

1) Horizontal $y = b$
(Slope is Zero)




2) Vertical $x = a$
(Slope is undefined)

Graph $x = -3$, and $y = 5$.
Clearly mark their intersection Point.




Graph $y = -4$, $x = 6$, and $y = \frac{4}{5}x$ in the Same coordinate system.
Shade the region enclosed by all 3 lines.

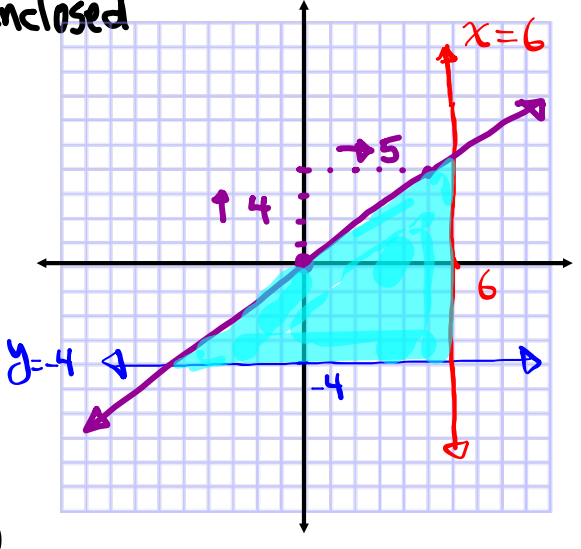
$y = -4$ Horizontal line

$x = 6$ Vertical line

$y = \frac{4}{5}x$ Slant line

$y = \frac{4}{5}x + 0$ $m = \frac{4}{5}$

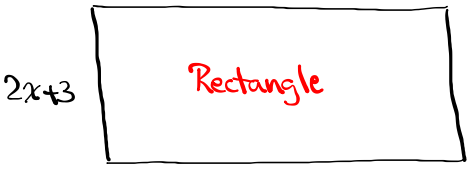
Y-Int (0,0)



Find area and perimeter of the shape below:

$A = LW$

$P = 2L + 2W$




Binomial
Deg. = 3 L.C. = 8
Const. = 27

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

$= 8x^3 - 12x^2 + 18x + 12x^2 - 18x + 27 = \boxed{8x^3 + 27}$

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

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

$= -8x + 24 + 8x^2$

$\boxed{P = 8x^2 - 8x + 24}$

Trinomial, D = 2
L.C. = 8 Const. 24

Factor Completely:

1) $6x^2y - 8xy^4 = 2 \cdot 3 \cdot x \cdot x \cdot y - 2 \cdot 2 \cdot 2 \cdot x \cdot y \cdot y \cdot y \cdot y$

GCF $= \boxed{2xy(3x - 4y^3)}$

2) $3x(2x-5) - 8(2x-5)$

$= (2x-5)(3x-8)$

3) $x^2 - 13x + 36 = \boxed{(x-4)(x-9)}$

$1 \cdot 36$, $2 \cdot 18$, $3 \cdot 12$, $4 \cdot 9$, $6 \cdot 6$ FOIL to Verify

Special Factoring with two-Terms:

$A^2 + B^2$ Sum of two Squares

$A^2 - B^2$ Difference of two Squares

$A^3 + B^3$ Sum of two Cubes

$A^3 - B^3$ Difference of two Cubes

$A^2 + B^2 =$ Prime

$A^2 - B^2 = (A+B)(A-B)$

$A^3 + B^3 = (A+B)(A^2 - AB + B^2)$

$A^3 - B^3 = (A-B)(A^2 + AB + B^2)$

Factor Completely:

$x^2 + 25 = x^2 + 5^2 =$ Prime

$x^2 - 25 = x^2 - 5^2 = (x+5)(x-5)$

$x^3 + 125 = x^3 + 5^3 = (x+5)(x^2 - 5x + 25)$

$x^3 - 125 = x^3 - 5^3 = (x-5)(x^2 + 5x + 25)$

Factor Completely:

1) $x^2 + 100 = x^2 + 10^2 =$ **Prime**

2) $x^2 - 100 = x^2 - 10^2 = (x+10)(x-10)$

3) $x^3 + 1000 = x^3 + 10^3 = (x+10)(x^2 - 10x + 100)$

4) $x^3 - 1000 = x^3 - 10^3 = (x-10)(x^2 + 10x + 100)$

Solve and graph:

$3x - 8 < 5x + 4$

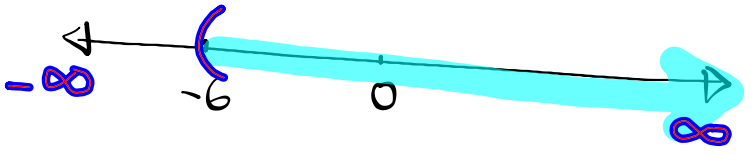
$3x - 5x < 4 + 8$

$-2x < 12$

Divide by $-2$

$\frac{-2}{-2}x > \frac{12}{-2}$

$x > -6$



Graph the Solution

$\frac{1}{3}x + 2 \geq \frac{1}{2}x - 2$

To clear fractions, we can multiply by LCD

LCD = 6

$\cancel{6}^{2} \cdot \frac{1}{\cancel{3}}x + 6 \cdot 2 \geq \cancel{6}^{3} \cdot \frac{1}{\cancel{2}}x - 6 \cdot 2$

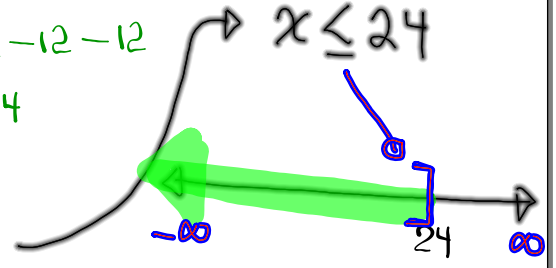
$2x + 12 \geq 3x - 12$

$2x - 3x \geq -12 - 12$

$-x \geq -24$

Divide by $-1$

$\frac{-x}{-1} \leq \frac{-24}{-1}$




1) Portrait style

2) One file only

3) Page-Per-Page Contents

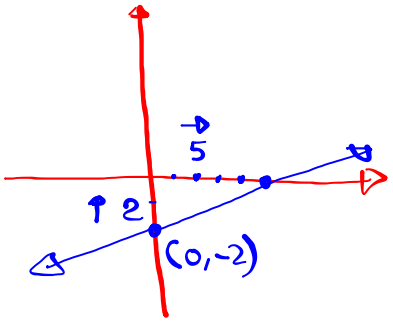
4) Pages must be in order.

Class Qz 2

① Graph $y = \frac{2}{5}x - 2$

$m = \frac{2}{5}$

Y-Int $(0, -2)$




② Simplify: $(x+3)(x-5)+15$

$= x^2 - 5x + 3x - 15 + 15 = \boxed{x^2 - 2x}$