

Function Review: Graphs

the class intention for today is to review graph shifting rules, graph, state domain and range, calculate the slope and equation of a line

Aug 29-7:57 AM

Function Review: GraphsGraph Shifting

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

$$f(x) + c \quad \text{up } c$$

$$f(x) - c \quad \text{down } c$$

$$f(x+c) \quad \text{left } c$$

$$f(x-c) \quad \text{right } c$$

$$f(c-x) \quad \text{right } c$$

$$f(-x) \quad \text{flips around } y\text{-axis}$$

what makes
()
EQUAL ZERO

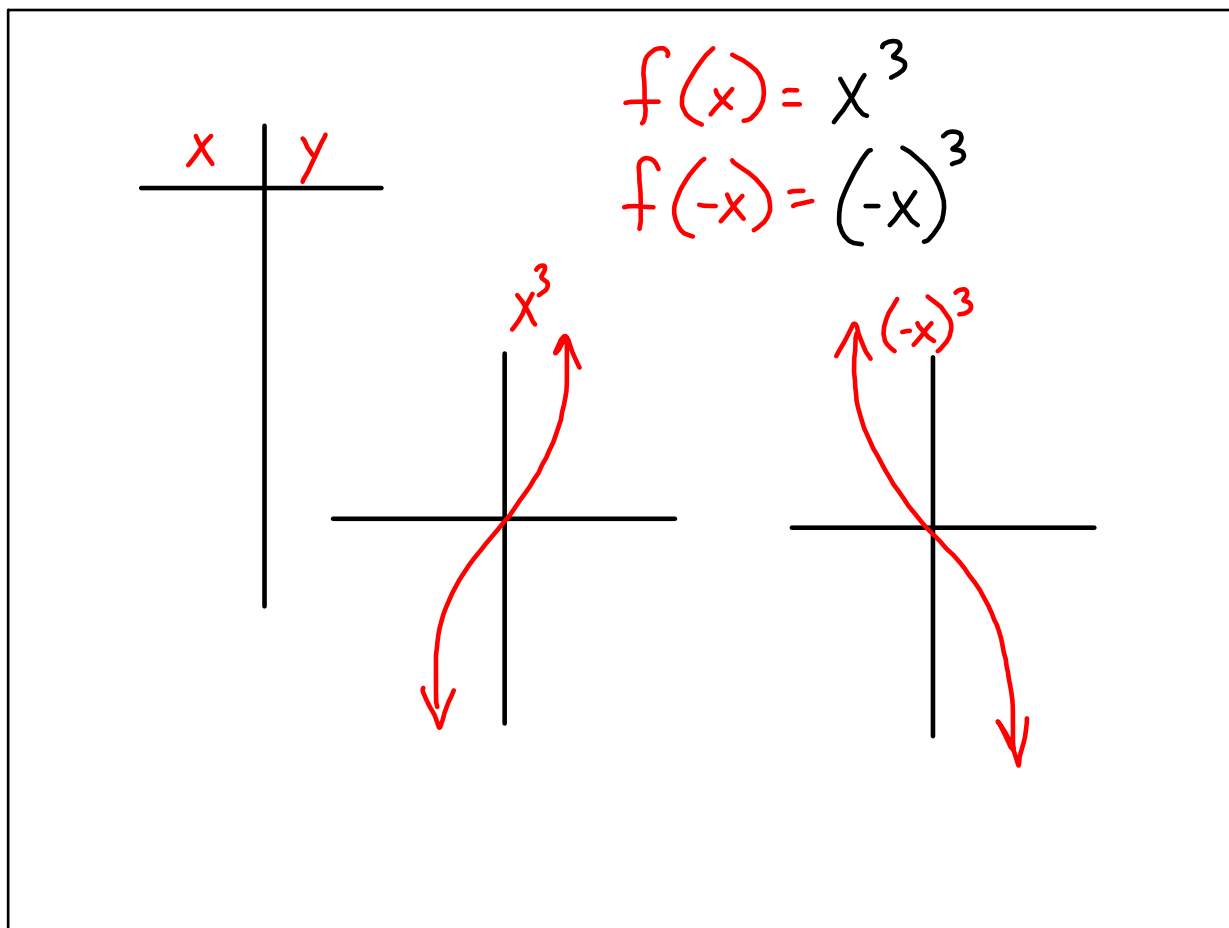
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$-f(x)$ flip over X-axis

$cf(x)$ slope changes...

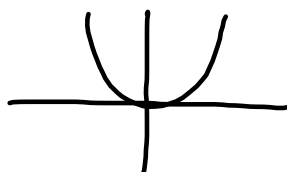
If... $\begin{cases} 0 < c < 1 & \text{wider} \\ c > 1 & \text{steeper} \end{cases}$

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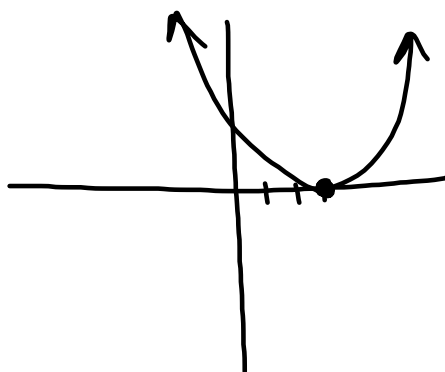
$$f(x) = x^2$$



$$f(x) = (3-x)^2$$

RIGHT 3 units

x	y
0	9
1	4
2	1
3	0
4	1
5	4



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Function Review: Graphs

Parent Functions

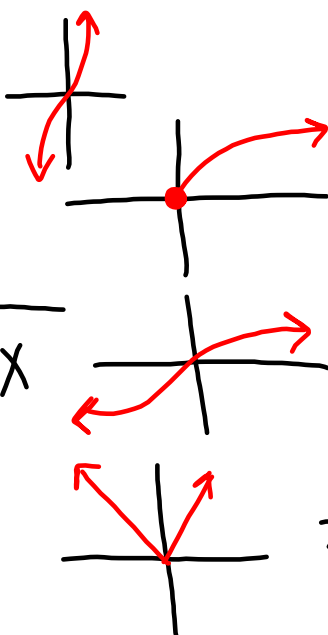
$$f(x) = x^2$$

$$f(x) = x^3$$

$$f(x) = \sqrt{x}$$

$$f(x) = \sqrt[3]{x}$$

$$f(x) = |x|$$



$$f(x) = \begin{cases} x, & x \geq 0 \\ -x, & x < 0 \end{cases}$$

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Function Review: Graphs

domain / range

domain \rightarrow input, what can plug
in to the $f(x)$ and get an
output (x-values)

Range \rightarrow output 'y-values'

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D/R

$$f(x) = 2x^2$$

$$d = \{ \mathbb{R} \}$$

$$r = \{ y \geq 0 \}$$

$$f(x) = \frac{2x}{3x^2 - 1}$$

$$d = \left\{ \mathbb{R} - \pm\sqrt{\frac{1}{3}} \right\}$$

↑
EXCEPT

$$3x^2 - 1 = 0$$

$$x = \pm\sqrt{\frac{1}{3}}$$

$$r = \left\{ \mathbb{R} - ? y = 0 \right\}$$

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$$f(x) = \sqrt{x+3} \quad [0, \infty)$$

$$\text{Range: } y \geq 0$$

$$x+3 \geq 0$$

$$d = x \geq -3$$

$$[-3, \infty)$$

x	y
-3	0
-2	1
-1	2
0	3.2
1	2.2

100000

$$f(x) = \frac{1}{\sqrt{x+3}}$$

$$x+3 > 0$$

$$d = x > -3$$

$$(-3, \infty) = \text{domain}$$

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Function Review: Graphs

Slope of a line

$$m = \frac{y - y}{x - x} = \frac{\text{distance between } y\text{'s}}{\text{distance between } x\text{'s}}$$

$$\textcircled{\text{ex}} \quad (1, 78) \quad (4, 13)$$

$$\frac{78-13}{1-4} = \frac{65}{-3} = m$$

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Function Review: Graphs

equation of a line

$$(1, 2) \text{ \& } (-3, 6)$$

• find slope ... $\frac{6-2}{-3-1} = \frac{4}{-4} = -1 = m$

• use $y = mx + b$... along with ONE point & slope

→ $2 = (-1)(1) + b$

• Solve for b ... $b = 3$

• Write equn... $y = -1x + 3$

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Function Review: Graphs

$$y - y_1 = m(x - x_1) \quad \text{point-slope}$$

$$(4, 6) \text{ } (3, 11)$$

$$y - 11 = -5(x - 3)$$

$$\frac{6-11}{4-3} = \frac{-5}{1} = -5 = m$$

$$y - 11 = -5x + 15$$

+11 +11

$$y = -5x + 26$$

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Function Review: Graphs

$$f(x) = \sqrt{-x+4} - 7$$

shifts 4 right

shifts down 7

do NOT want $(-x+4)$ to be negative!

$$-x+4 \geq 0$$

$$-4 \quad -4$$

$$-x \geq -4$$

$$\underline{x \leq 4} \text{ domain}$$

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Function Review: Graphs

⑦ $(3, 5)$ $(8, 15)$

$$m = \frac{5-15}{3-8} = \frac{-10}{-5} = 2$$

$$y - y = m(x - x)$$

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

$$y - 5 = 2x - 6$$

$$\underline{y = 2x - 1}$$

$$y = mx + b$$

$$5 = 2(3) + b$$

$$5 = 6 + b$$

$$-6 \quad -6$$

$$-1 = b$$

R.W.

$$\underline{y = 2x - 1}$$

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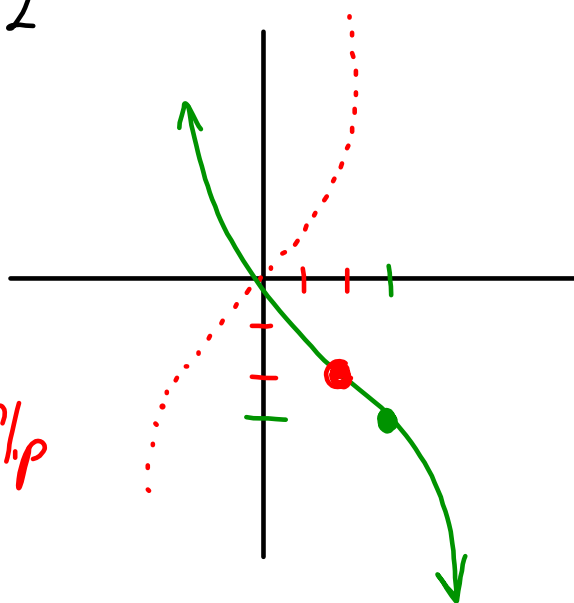
$$(-x+2)^3 - 2$$

$$\text{dom} = \mathbb{R}$$

Right 2

Down 2

Horizontal flip



x	y
2	-2
0	6
3	-3
108	-108
-108	+108

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