Pick up the Warm Up

HW QUESTIONS

Tomorrow

Turn in the 2nd HW Packet

Quiz on Sequences & Exponential Functions

1. Last week we learned to create an exponential function in the form $y=ab^x$ using the "Double Substitution Method". Use it now to find the exponential function that passes through the two points (2 , 12) and (5, 187.5)

(2, 12) $y = ab^x$ $12 = ab^2$

(5, 187.5) $y = ab^x$ $187.5 = ab^5$

Compound Interest Formula:

$$\textbf{\textit{Future Value}} = \text{PV}(1 + \frac{r}{k})^{kt}$$

where PV = Present Value

r = annual interest (as a decimal)

t = number of years \$ is being invested

k = # times per year interest is compounded

(2) Find the future value of an 8 year investment of \$4500 that pays an annual interest of 4.25%, compounded once once a year.

(3) Find the future value of an 8 year investment of \$4500 that pays an annual interest of 4.25%, compounded once TWICE a year.

$$Future\ Value = PV\ (1 + \frac{r}{k})^{kt}$$

(4) $n^{5/4}$ _____

$x^{\frac{n}{5}}$ _____

$\sqrt[4]{17^3}$ _____

$\sqrt[3]{x^2}$ _____

(5) $40x^2 + 80x - 50$

remember that all common factors have to pulled out first in order to use the box method.

$10(\quad)$

$10(4x^2 + 8x - 5)$

$10(\quad)(\quad)$

$-20x \cdot x$
$20x \cdot -x$
$-10x \quad 2x$
$10x \quad -2x$
$-5x \quad 4x$
$5x \quad -4x$

(6) Solve

$(16)^n = 4^{5n+1}$

The 2nd Homework Packet is due tomorrow. Stiff penalty if late.

QUESTIONS ON HW

B-53

a) $2x + y = -7y$ Substitution!

$y = x + 10$

$2x + (x+10) = -7(x+10)$

$3x + 10 = -7x - 70$

$+7x \quad +7x$

$10x + 10 = -70$

$10x = -80$

$x = -8$

$y = -8 + 10$

$= 2$

solution $(-8, 2)$

b) $3x = -5y$ re-arrange

$6x - 7y = 17$

$3x + 5y = 0$

$6x - 7y = 17$

multiply 1st equation by -2

$-6x + -10y = 0$

$+ \quad 6x - 7y = 17$

$-17y = 17$

$y = -1$ $\quad 3x = -5(-1)$

$3x = 5$

$x = \frac{5}{3}$

Solution $\left(\frac{5}{3}, -1\right)$

3 a) $3 \cdot x^2 \cdot \frac{1}{x^{-1}} \cdot y^{-3} \cdot \frac{1}{y^2}$

$3 \cdot x^2 \cdot x \cdot \frac{1}{y^3} \cdot \frac{1}{y^2}$

$\frac{3x^3}{y^5}$

b) $\frac{m^2 p^1 \cdot q^{-1}}{4m^{-2} p^1 q^3}$

$\Downarrow$

$\frac{m^2 \cdot m^2}{4 \cdot q^1 \cdot q^3}$

$= \frac{m^4}{4q^4}$

B-89

(7, 16) (2, -4)

Equation of a line

slope

$m = \frac{y - y}{x - x}$

$= \frac{16 - -4}{7 - 2}$

$= \frac{20}{5}$

$= 4$

$y = mx + b$

$16 = 4(7) + b$

$16 = 28 + b$

$-28 \quad -28$

$b = -12$

$y = 4x - 12$

y-intercept

(0, -12)

x-intercept:

set $y = 0$

$0 = 4x - 12$

$4x = 12$

$x = 3$

(3, 0)

B-94

Write Exponential functions

a) (1, 7.5) (3, 16.875)

$y = ab^x$ $y = ab^x$

$7.5 = ab^1$ $16.875 = ab^3$

Using method I from class → solve for a

$a = \frac{7.5}{b}$

$16.875 = \frac{7.5}{b} \cdot b^3$

$16.875 = 7.5b^2$

$b^2 = \frac{16.875}{7.5}$

$b = 1.5$ → $a = \frac{7.5}{1.5} = 5$

$y = 5(1.5)^x$

(b) $(-1, 1.25)$ $(3, 0.032)$

$y = ab^x$ $y = ab^x$

$1.25 = ab^{-1}$ $0.032 = ab^3$

Using method 2 from class

Divide 2nd equation by the first

$$\frac{.032}{1.25} = \frac{ab^3}{ab^{-1}}$$

$$.0256 = b^3 \cdot b^1$$

$$b^4 = .0256$$

$$\sqrt[4]{\quad} \quad \sqrt[4]{\quad}$$

$$b = 0.4$$

$ab^3 = .032$

$a(.4)^3 = .032$

$a = \frac{.032}{.4^3}$

$a = 0.5$

$y = 0.5(0.4)^x$

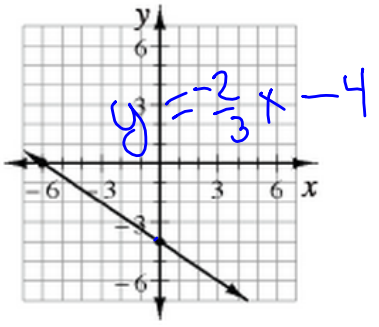
2-6 A negative coefficient ●● ····●●·

$y = x^2$

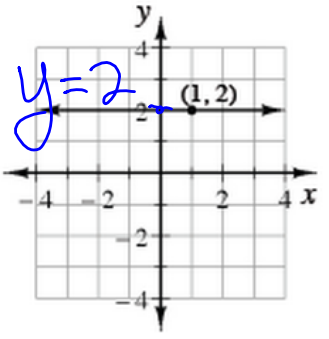
$y = -3x^2$

$y = -0.25x^2$

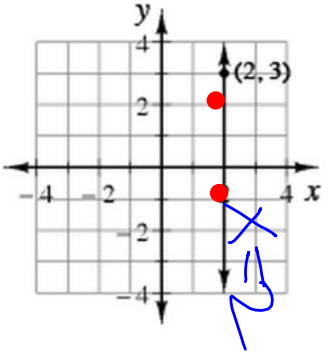
2-9

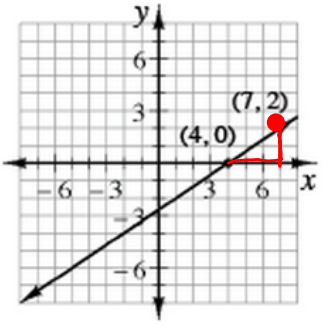
a. 

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

b. 

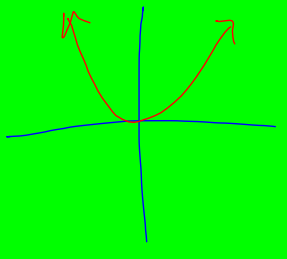
$y = 2$

c. 

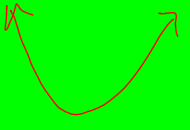
d. 

Aim

How do I shift a parabola?



$y = x^2$



✓ **Decide who will be your group's:**

"Reader" ?

"Spy" ?

✓ page 60

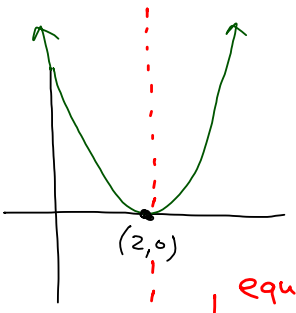
Notes

2-11 core problem

✓ I'll be circulating to answer questions

✓ I will assume you will have discussed w/ each other first.

✓ The Spy can go to another group to get help as needed.
- No repeats -



equation of line of symmetry is $x=2$

(b)

$Y_1 =$ experiment in Y_1

$5(x-2)(x-2)$

$9(x-2)(x-2)$

$(3x-6)(3x-6)$

$3(x-2)3(x-2)$

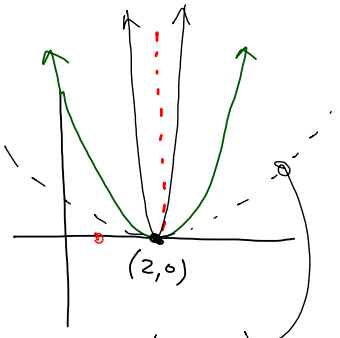
$Y_2 = (x-2)(x-2)$

$y = (x-2)^4$

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

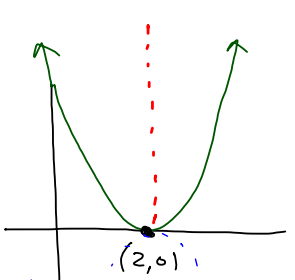
$= 2(x-1)2(x-1)$

$4(x-1)(x-1)$



$\frac{1}{2}(x-2)(x-2)$

~~b~~ c



c

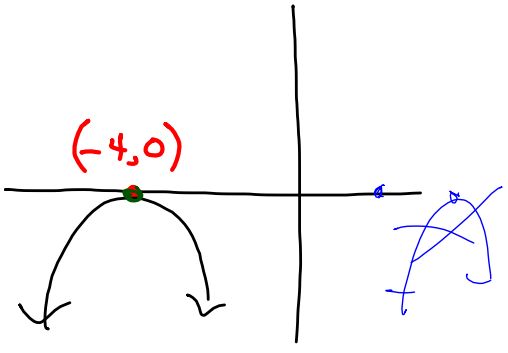
$y = -(x-2)(x-2)$

$-4(x-2)(x-2)$

$-\frac{1}{2}(x-2)(x-2)$

d

$y = -(x+4)(x+4)$



$-(x-4)(x-4)$

Why does $y = (x-2)(x-2)$ only touch the x-axis at $x=2$?

Sharing of equations you have developed.

parabolas that touch the x-axis only at $x=2$

(and open downward)

How can we simplify all of these?

Assignment

2- ... 16, 17, 18ab, 19-20, 21c

Tomorrow you will turn in the HW Packet