

Pick up the Warm Up

HW
QUESTIONS



Monday

Turn in the 2nd HW Packet

and there will be a Quiz on Sequences & Exponential Functions



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 $(5, 187.5)$

$$\begin{array}{l} (2, 12) \\ \swarrow \searrow \\ y = ab^x \end{array}$$

$$\begin{array}{l} (5, 187.5) \\ \swarrow \searrow \\ y = ab^x \end{array}$$

$$187.5 = \frac{12}{b^2} \cdot b^3$$

$$\text{so } 12b^3 = 187.5$$

$$b^3 = \frac{187.5}{12}$$

$$\sqrt[3]{\quad} \quad \sqrt[3]{\quad}$$

$$b = 2.5$$

$$12 = ab^2$$

$$a = \frac{12}{b^2}$$

$$187.5 = ab^5$$

$$a = \frac{12}{(2.5)^2} = 1.92$$

$$y = 1.92(2.5)^x$$

Compound Interest Formula:

$$y = ab^x$$

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

$$PV \left(\right)^t$$

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.

$$FV = 4500(1.04)^8 = \$6,158.56$$

$100 + 4 = 104$

- 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.

$$FV = PV \left(1 + \frac{r}{k}\right)^{kt} = 4500 \left(1 + \frac{.04}{2}\right)^{2(8)} = \$6,177.54$$

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

d

September 28, 2018

④

$$n^{5/4} \quad \sqrt[4]{n^5} = (\sqrt[4]{n})^5 = (\sqrt[4]{n})^5$$

$$x^{n/5} \quad \sqrt[5]{x^n} \text{ or } (\sqrt[5]{x})^n$$

$$\sqrt[4]{17^3} \quad 17^{3/4}$$

$$\left(\sqrt[3]{x}\right)^2 \quad x^{2/3}$$

⑤

$$40x^2 + 80x - 50$$

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

$$10 (\quad)$$

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

$$10 (\quad) (\quad)$$

⑥ Solve

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

QUESTIONS ON
HW

B-53 a) $2x + y = -7y$ Substitution!
 $y = x + 10$

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

$$\begin{array}{r} 3x + 10 = -7x - 70 \\ +7x \quad +7x \end{array}$$

$$10x + 10 = -70$$

$$10x = -80$$

$$x = -8$$

$$y = -8 + 10 = 2$$

Solution
 $(-8, 2)$

b) $3x = -5y$ re-arrange
 $6x - 7y = 17$

$$\begin{array}{r} 3x + 5y = 0 \\ 6x - 7y = 17 \end{array}$$

multiply 1st equation
by -2

$$\begin{array}{r} -6x + -10y = 0 \\ + \quad 6x - 7y = 17 \\ \hline -17y = 17 \end{array}$$

$$y = -1$$

$$3x = -5(-1)$$

$$3x = 5$$

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

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

B-73 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) $\frac{m^2 \cancel{q^{-1}}}{4m^{-2} \cancel{q^3}}$

\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 $m = \frac{y_2 - y_1}{x_2 - x_1}$

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

$= \frac{20}{5}$

$= 4$

$y = mx + b$

$16 = 4(7) + b$

$16 = 28 + b$

$-20 \quad -28$

$b = -12$

$y = 4x - 12$

x-intercept:
set $y = 0$

$0 = 4x - 12$

$4x = 12$

$x = 3$

$(3, 0)$

y-intercept
 $(0, -12)$

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 1 from class solve for a
 $a = \frac{7.5}{b}$

$16.875 = \frac{7.5}{b} \cdot b^3$
 $16.875 = 7.5 b^2$
 $b^2 = \frac{16.875}{7.5}$
 $b = 1.5 \rightarrow a = \frac{7.5}{1.5} = 5$

$y = 5(1.5)^x$

(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

$\frac{0.032}{1.25} = \frac{ab^3}{ab^{-1}}$
 $0.0256 = b^3 \cdot b^1$
 $b^4 = 0.0256$
 $\sqrt[4]{\quad} \sqrt[4]{\quad}$
 $b = 0.4$

$ab^3 = 0.032$
 $a(.4)^3 = 0.032$
 $a = \frac{0.032}{.4^3}$
 $a = 0.5$

$y = 0.5(0.4)^x$

2-6

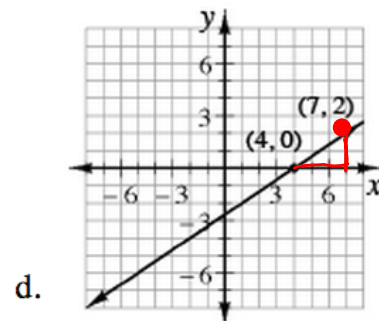
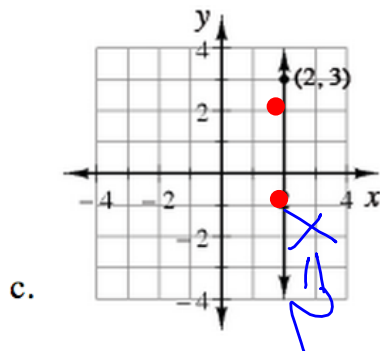
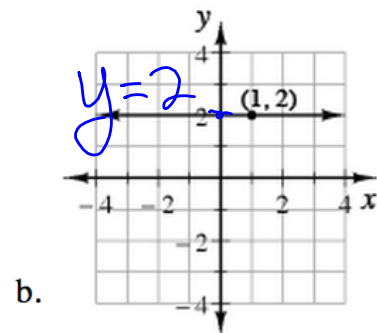
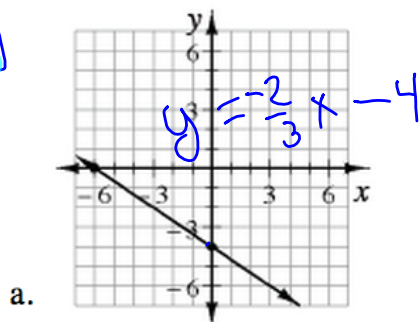
A negative coefficient ●● ... ●●

$$y = x^2$$

$$y = -3x^2$$

$$y = -0.25x^2$$

2-9



Aim How can \underline{I}
translate (shift)
a parabola? slide

$$y_1 =$$

←

$$y_2 = (x-2)(x-2)$$
$$y_3$$

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

"Reader" ?
"spy" ?

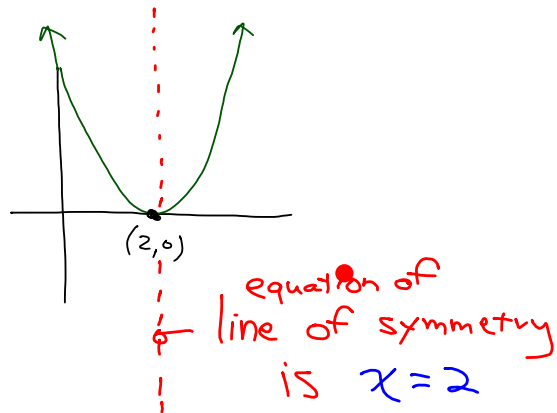
✓ page 60

Notes

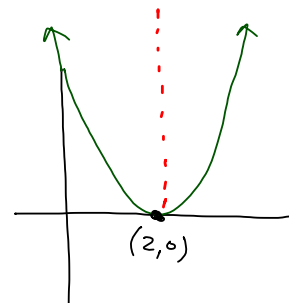
2-11 core problem

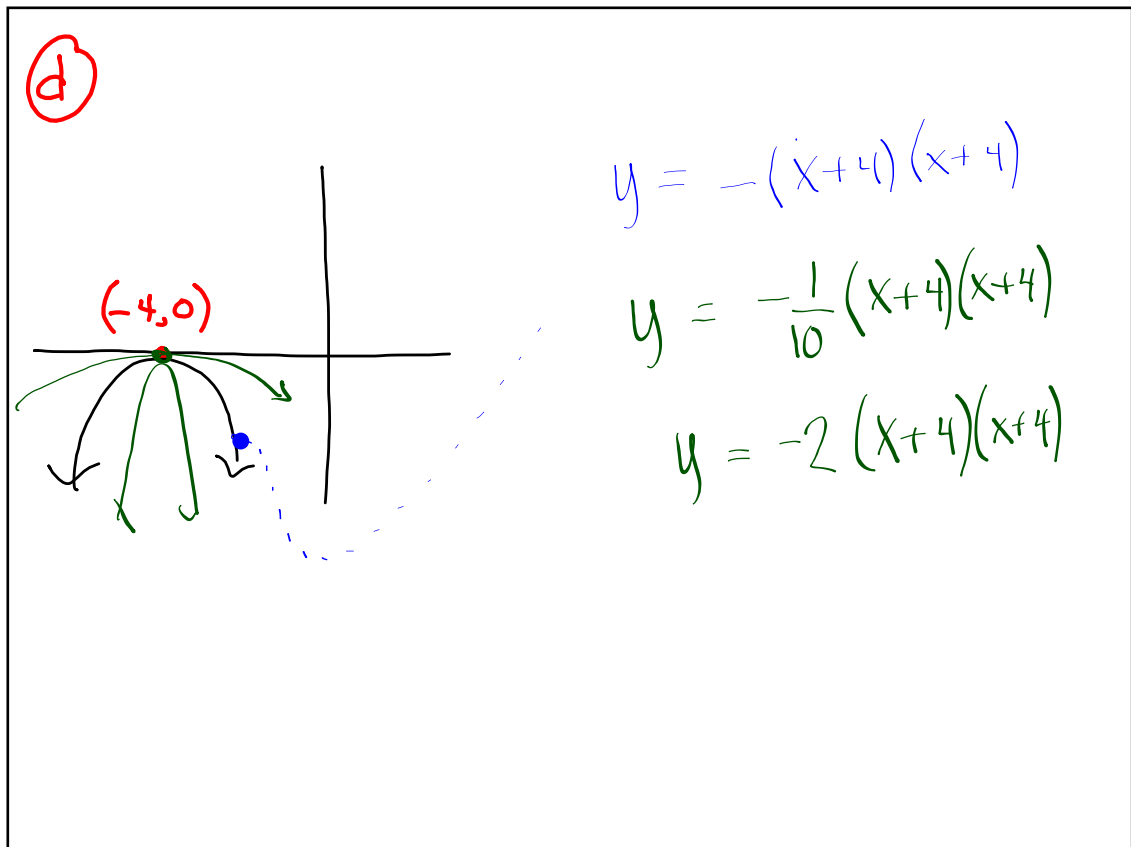
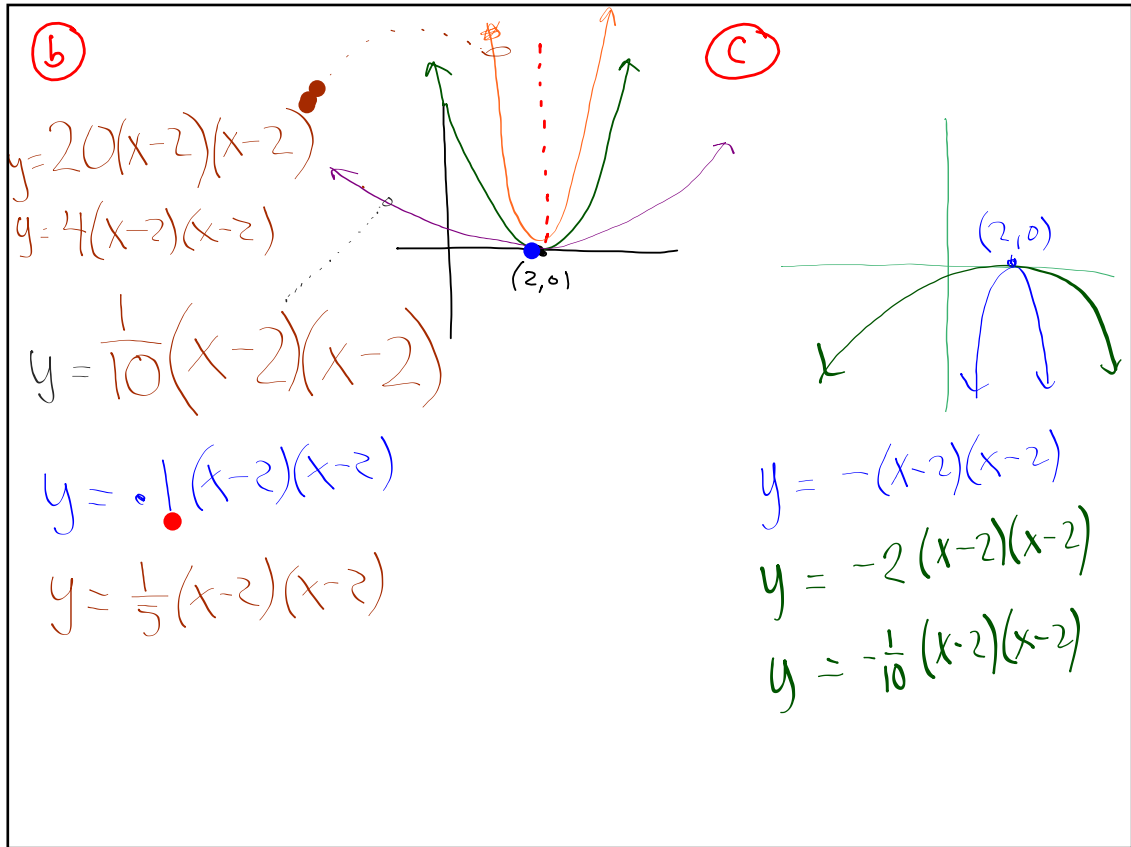
- ✓ I'll be circulating to answer questions
- ✓ I will assume you will have discussed w/each other first.
- ✓ The spy can go to another group to get help as needed.

- No repeats -



(b) $Y_1 =$ ← experiment in Y_1
 $Y_2 = (x-2)(x-2)$





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?

**The 2nd Homework Packet is due
Monday. Penalty if late.**

Assignment

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

-