

# Day 2

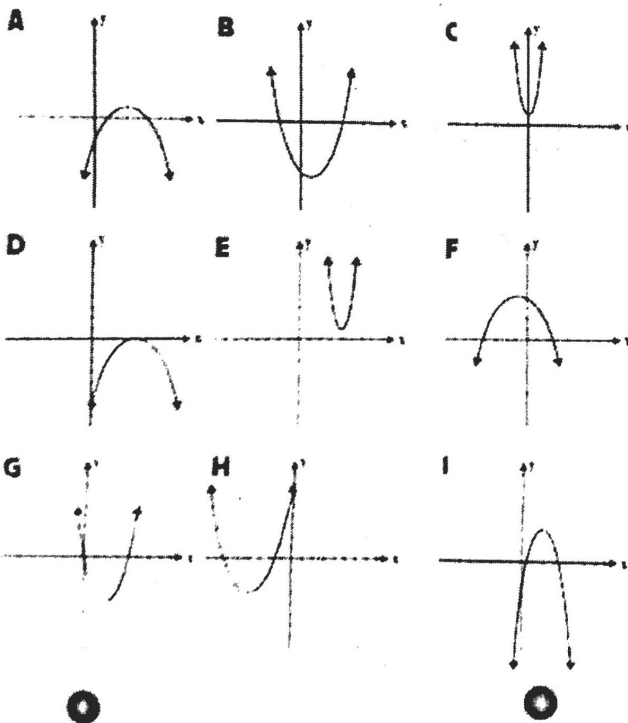
Thursday, September 14, 2017  
8:14 AM

2.2 Graphi... 2.2 warm-...

Warm-up:

## WHO AM I?

Parabolas: identify all the possible answers for each clue.



(name) \_\_\_\_\_

### CLUES

My axis of symmetry is  $x = 2$ .

a, g, i

In my equation,  $a > 0$ .

b, c, e, g, h

I have no zeros.

c, e

My range is  $y \leq 0$ .

d

My zeros are at  $x = -2$  and  $x = 4$ .

b

My maximum value is  $y = 4$ .

f, i

I have a minimum value.

b, c, e, g, h

My range is  $y \geq -3$ .

g, h

My domain is all real numbers.

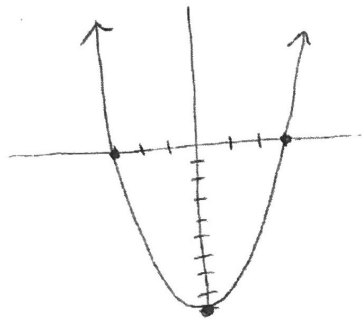
a, b, c, d, e, f, g, h, i

Homework Questions from Tues and Wed:

**\*\*Finish Day 1: Solving Radical equations\*\*\***

Notes: Day 2 Polynomial Equations

Example 1: Graph  $y = x^2 - 9$  without a calculator.



1. y-int:  $(0, -9)$
2.  $y = (x-3)(x+3)$   
 $x = 3, -3 \leftarrow$  zeroes
3.  $a > 0$ , opens up

Q1: How are the zeros related to the factors?

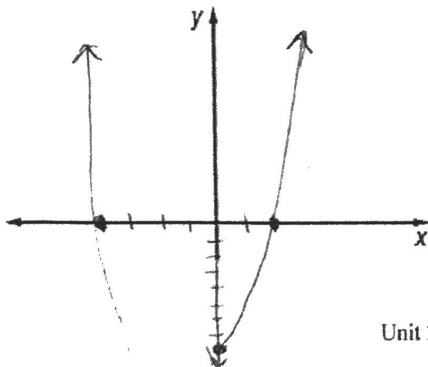
Q2: Is this function even or odd? even

Q3: Describe the end behavior using limits.

$$\lim_{x \rightarrow \pm\infty} f(x) = \infty$$

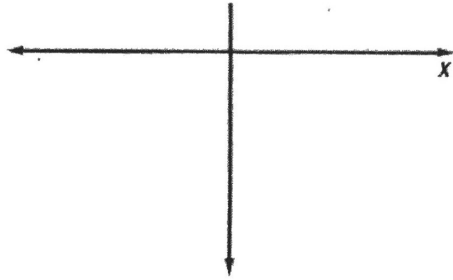
$\begin{matrix} x-3=0 \\ +3 \\ +3 \end{matrix} \rightarrow x=3$   
Solve each factor = 0.

Example 2: Graph  $y = (x-2)(x+4)$  without a calculator.



$$\begin{aligned} x^2 + 4x - 2x - 8 \\ x^2 + 2x - 8 \end{aligned}$$

y-int:  $(0, -8)$   
zeroes:  $x = 2, -4$



Q1: How are the zeros related to the factors? *opposites*

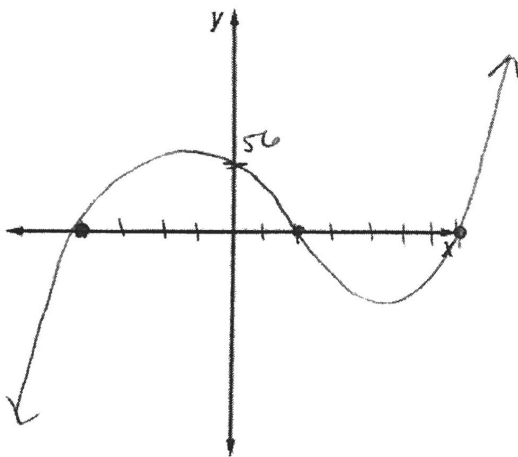
Q2: Is this function even or odd? *even*

Q3: Describe the end behavior using limits.

$$\lim_{x \rightarrow \pm \infty} f(x) = \infty$$

Example 3: Graph  $y = (x - 2)(x + 4)(x - 7)$  without a calculator.

zeros:  $x = 2, -4, 7$



$$(x^2 + 4x - 2x - 8)(x - 7)$$

$$(x^2 + 2x - 8)(x - 7)$$

$$x^3 - 7x^2 + 2x^2 - 14x - 8x + 56$$

$$x^3 - 5x^2 - 22x + 56$$

y-int:  $(0, 56)$  ← *not helpful*

$a > 0 \rightarrow \uparrow$

Q1: How are the zeros related to the factors? *opposites*

Q2: Is this function even or odd? *odd*

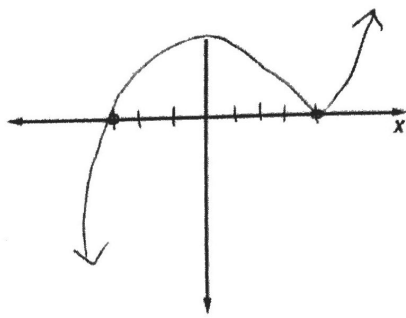
Q3: Describe the end behavior using limits.

$$\lim_{x \rightarrow -\infty} f(x) = -\infty \quad \lim_{x \rightarrow \infty} f(x) = \infty$$

Example 4: Graph  $y = (x + 3)(x - 4)^2$ .



*next page*



$$y = (x+3)(x-4)^2$$

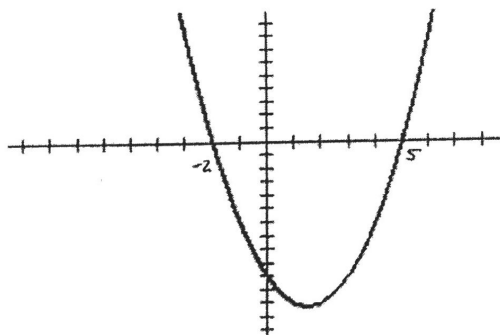
zeros:  $x = -3$   $x = 4, x = 4$  ↓ double root  
(bounces off)

$$a > 0$$

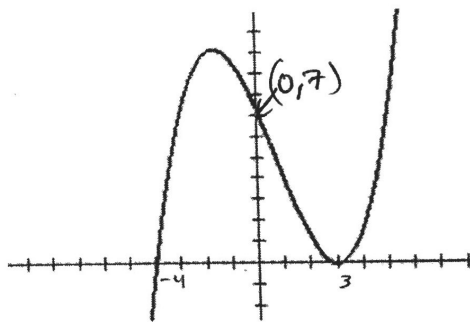
- Q1: How are the zeros related to the factors? <sup>opposites</sup> Is  $x = 4$  a zero? <sup>yes</sup>
- Q2: Is this function even or odd? <sup>odd</sup>
- Q3: Describe the end behavior using limits.

$$\lim_{x \rightarrow -\infty} f(x) = -\infty \qquad \lim_{x \rightarrow \infty} f(x) = -\infty$$

Example 5: Can you write a possible equation for the given graphs?



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



$$y = a(x+4)(x-3)^2$$

$$7 = a(0+4)(0-3)^2$$

$$7 = a(4)(-3)^2$$

$$7 = a(4)(9)$$

$$7 = 36a$$

$$\frac{7}{36} = a$$

$$y = \frac{7}{36}(x+4)(x-3)^2$$