Monday, February 4, 2013

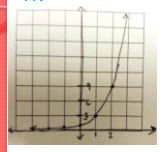
Agenda:

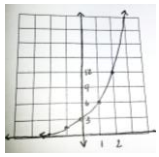
- TISK & No MM
- HW Check
- Lesson 12-7
- Homework: Finish Ch12 HW Packet 2

TISK

1) Evaluate: $-8 + 12 - 3(-6 + 7) - 4$
2) Write the equation of a line that passes through the points (-5, 12) and (-10, 10).
3) Write and solve a proportion:
   Twenty-eight is thirty percent of what number?

Homework Check

19. 

20. 

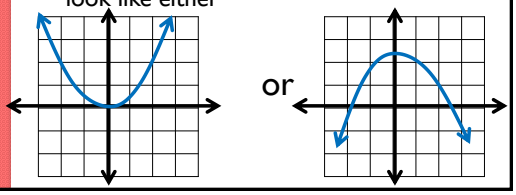
21. 

Homework Check

22. $f(-5) = -6250$
    $f(0) = -2$
    $f(5) = -\frac{2}{3125}$
23. $f(-5) = 6400$
    $f(0) = 200$
    $f(5) = \frac{25}{4} \text{ or } 6\frac{1}{4}$
24. exponential decay
    After 34,380 years only $1\frac{9}{16}\% \text{ or } 1.5625\%$ remains.
25. exponential growth
    After one week, there would be 640,000 bacteria.
26. exponential decay
    Between 25mg and 50mg remain after 12 hours.

§12-7 Quadratic Functions

- What makes a function quadratic?
  - The highest power of the independent variable is 2.
- Quadratic Functions have graphs that look like either



§12-7 Quadratic Functions

- Is it a quadratic function?

$$f(x) = 3x^3 + 4$$

No!

The highest power can only be 2.

§12-7 Quadratic Functions

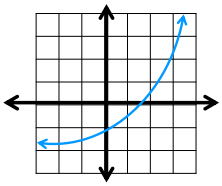
- Is it a quadratic function?

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

Yes!

§12-7 Quadratic Functions

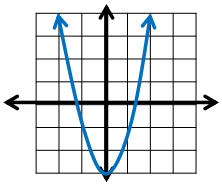
- Is it a quadratic function?



No!
Wrong shape.

§12-7 Quadratic Functions

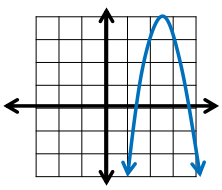
- Is it a quadratic function?



Yes!

§12-7 Quadratic Functions

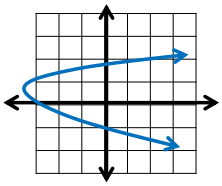
- Is it a quadratic function?



Yes!

§12-7 Quadratic Functions

- Is it a quadratic function?



No!

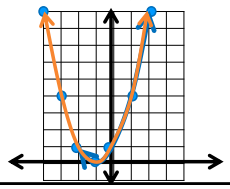
It's not a function.

§12-7 Quadratic Functions

- To graph a quadratic function,
  1. Choose 5 *x*-values:
     - Two positive, two negative, and zero.
  2. Evaluate the function at those values.
  3. Plot the points.
  4. Connect with a smooth curve.

Graph $f(x) = x^2 + 2x + 1$

x	$f(x)$	
-2	1	$f(-2) = (-2)^2+2(-2)+1$
-1	0	$f(-1) = (-1)^2+2(-1)+1$
0	1	$f(0) = (0)^2+2(0)+1$
1	4	$f(1) = (1)^2+2(1)+1$
2	9	$f(2) = (2)^2+2(2)+1$



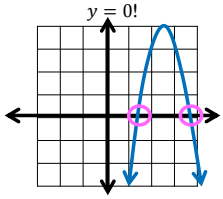
§12-7 Quadratic Functions

- If a quadratic function is written as a product of two binomials, then you can graph it a little easier by finding its ***x*-intercepts**
  - ***x*-intercepts** are where the graph crosses the *x*-axis
  - A product of binomials is when the function looks like this: $f(x) = (x + 5)(x - 9)$
    - When you multiply $(x + 5)$ by $(x - 9)$ you get an x^2 term.

§12-7 Quadratic Functions

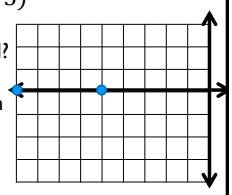
- If the *x*-intercepts are where the graph crosses the *x*-axis, what is the *y*-value at that point?

At the *x*-intercept(s), $y = 0$!



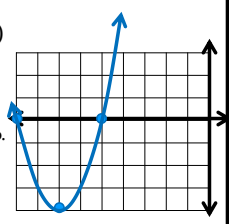
§12-7 Quadratic Functions

- So take the example $f(x) = (x + 9)(x + 5)$
  - Where would the *x*-intercepts be located?
  - Another way to think about it is to ask, when does $f(x) = 0$?
    - If either $(x + 9)$ is 0 or $(x + 5)$ is 0.
    - So solve $(x + 9) = 0$ or $(x + 5) = 0$
    - $x = -9$ or -5



§12-7 Quadratic Functions

- So take the example $f(x) = (x + 9)(x + 5)$
  - x −intercepts: $x = -9$ or -5
  - Now, find a value for *f*(*x*) that lies between these two.
- $f(-7) = (-7 + 9)(-7 + 5)$
  - $f(-7) = (2)(-2)$
  - $f(-7) = -4$



§12-7 Quadratic Functions

- Find the *x*-intercepts of the function:
  - $f(x) = (x - 4)(x + 3)$
  - $f(x) = (-x + 2)(x - 6)$