

July 15, 2015

Graph & State Domain and Range

9.3  $h(x) = \frac{1}{2}x + 4$

x	h(x)
-8	0
0	4

$0 = \frac{1}{2}x + 4$   
 $-4 = \frac{1}{2}x$   
 $-\frac{4}{\frac{1}{2}} = \frac{1}{\frac{1}{2}}x$   
 $-\frac{4}{1} \cdot \frac{2}{1} = x$   
 $-8 = x$

$h(x) = \frac{1}{2}x + 4$   
 $\frac{1}{2} \cdot \frac{x}{1} = \frac{x}{2}$   
 So,  $\frac{1}{2}x = \frac{x}{2}$

Jul 15-2:10 PM

10.1 Exercises

1-10 all, 51-71 odd

10.1  $\Rightarrow$   $(y-2)^2 - 1 = 0$

\* Isolate squared term

$\frac{4(y-2)^2}{4} = \frac{1}{4}$

$\sqrt{(y-2)^2} = \pm \sqrt{\frac{1}{4}}$  ← use Product Rule

\* Now use Square Root Property

$y-2 = \pm \sqrt{\frac{1}{4}} = \pm \frac{1}{2}$

$y-2 = \pm \frac{1}{2}$

$y = 2 \pm \frac{1}{2}$

①  $y = 2 + \frac{1}{2} = \frac{4}{2} + \frac{1}{2} = \frac{5}{2}$

②  $y = 2 - \frac{1}{2} = \frac{4}{2} - \frac{1}{2} = \frac{3}{2}$

Jul 15-2:17 PM

10.2 - Completing the Square methods to solve quadratics

- ① Factoring
- ② Square Root Property
- \* ③ Completing the Square
- ④ Quadratic Formula

Jul 15-2:32 PM

Perfect Square Trinomial

e.g.  $(x+4)^2 = (x+4)(x+4)$

$= x^2 + 4x + 4x + 16$

$= x^2 + 8x + 16$

Standard Form of a Quadratic

$ax^2 + bx + c = 0$

P.S.T.

$b = 8$

$8 \cdot \frac{1}{2} = 4$

Jul 15-2:35 PM

$b = 5$

$x^2 + 10x + 25 = (x+5)^2$

$(x+5)(x+5)$

FOIL

$x^2 + 5x + 5x + 25$

$x^2 + 10x + 25$

Jul 15-2:40 PM

$b = 3$

$x^2 + 6x + 9 = (x+3)^2$

$b = -2$

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

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

$0: (x)(-2) = -2x$   
 $I: (-2)(x) = -2x$

$-4x$

$b = \frac{2}{3}$

$x^2 + \frac{4}{3}x + \frac{4}{9} = (x + \frac{2}{3})^2$

$\frac{4}{3} \cdot \frac{1}{2} = \frac{4}{6} = \frac{2}{3}$  ✓

Jul 15-2:42 PM

Complete the square on:

$$\square x^2 - 5x + 1 = 0$$

\* Note: Not factorable!

Steps

- 1) Isolate variable terms  
 $\square x^2 - 5x = -1$   
 $(-5) \div 2 = -\frac{5}{2}$   
 $(-\frac{5}{2})^2 = \frac{25}{4}$
- 2) Make sure  $a = 1$  or some other number  
 If not, divide all terms by  $a$ :  
 $\square x^2 - 5x = -1$   
 $(x - \frac{5}{2})^2 = \frac{-1 + \frac{25}{4}}{1}$
- 3) a) multiply by  $\frac{1}{a}$  if  $a \neq 1$   
 $(x - \frac{5}{2})^2 = \frac{21}{4}$   
 b) square the result from step 2  
 $(\frac{5}{2})^2 = \frac{25}{4}$   
 $x - \frac{5}{2} = \pm \sqrt{\frac{21}{4} + \frac{25}{4}}$   
 $x = \frac{5}{2} \pm \frac{\sqrt{46}}{2}$
- 4) Add the result from a + b to both sides of the equation
- 5) Write P.D.T. in  $(x + b)^2$  form  
 > where  $b$  is result of a + b
- 6) Now solve using Square Root Property
- 7) Check

Jul 15-2:47 PM