-College Algebra 2/13/19

Agenda:
- Warm up & 3.6
- How to: Receiving help from a tutor Presentation and Activity
- 5 minute break
- Mini-Project 3 Activity and Next Assigment
- §3.6 Mathematical Models: Building Function (pg. 58)

-Warm up

1. Find the distance between $(2,3)$ and $(7,-1)$
$x_1\ y_1$ $x_2\ y_2$

$d=\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

$d=\sqrt{(7-2)^2+(-1-3)^2}$

$d=\sqrt{5^2+(-4)^2}$

$d=\sqrt{25+16}$

$\sqrt{41}$

2 Find the distance between $(-x,0)$ and $(0,y)$
$x_1\ y_1$ $x_2\ y_2$

$d=\sqrt{(0-{-x})^2+(y-0)^2}$

$d=\sqrt{(0+x)^2+(y-0)^2}$

$d=\sqrt{x^2+y^2}$ $\longrightarrow$ $d=\cancel{x+y}$ not true

ex. $\sqrt{x^2-y^2}\neq x-y$ ✗

$\sqrt{x^2y^2}=xy$ ✓

ex. $\left(\frac{x}{y}\right)^2=\sqrt{\frac{x^2}{y^2}}=\frac{x}{y}$

ex. $\sqrt{x^2+y^2}\neq x+y$

$\sqrt{6^2+8^2}\neq 6+8$

$\sqrt{36+64}\neq 14$

$\sqrt{100}\neq 14$

$10\neq 14$

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- Warm up

1 Find the distance between $(\underset{x_1}{2}, \underset{y_1}{3})$ and $(\underset{x_2}{7}, \underset{y_2}{-1})$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(7-2)^2 + (-1-3)^2}$$
$$d = \sqrt{5^2 + (-4)^2}$$
$$d = \sqrt{25+16}$$
$$\sqrt{41}$$

2. Find the distance between $(\underset{x_1}{-x}, \underset{y_1}{0})$ and $(\underset{x_2}{0}, \underset{y_2}{y})$

$$d = \sqrt{(0 - -x)^2 + (y-0)^2}$$
$$d = \sqrt{(0+x)^2 + (y-0)^2}$$
$$d = \sqrt{x^2 + y^2}$$

$\longrightarrow$ $d = \cancel{x+y}$ not true

ex. $\sqrt{x^2 - y^2} \neq x - y$ ✗

$\sqrt{x^2 y^2} = xy$ ✓

ex. $\left(\frac{x}{y}\right)^2 = \sqrt{\frac{x^2}{y^2}} = \frac{x}{y}$

ex. $\sqrt{x^2 + y^2} \neq x + y$

$\sqrt{6^2 + 8^2} \neq 6 + 8$

$\sqrt{36 + 64} \neq 14$

$\sqrt{100} \neq 14$

$10 \neq 14$

• finish 3.3 pg 43 2/13/19

(18) find the average rate of change of
$h(x) = x^2 - 7x$ from 2 to 3

$a = 2 \quad b = 3$

$$A.R.O.C = \frac{f(b) - f(a)}{b - a} = \frac{h(b) - h(a)}{b - a}$$

$$= \frac{h(3) - h(2)}{3 - 2}$$

$$= \frac{-12 - (-10)}{3 - 2}$$

$$= \frac{-12 + 10}{3 - 2}$$

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

$$= -2$$

Side Work:

$h(x) = x^2 - 7x$
$h(3) = (3)^2 - 7(3)$
$h(3) = 9 - 21$
$h(3) = -12$

$h(x) = x^2 - 7x$
$h(2) = (2)^2 - 7(2)$
$h(2) = 4 - 14$
$h(2) = -10$

find an equation of the secant line containing $(2, h(2))$ and $(3, h(3))$
$(2, -10)$ and $(3, -12)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-12 - (-10)}{3 - 2} = -2$$

Slope $= -2$
point $= (2, -10)$

$y - y_1 = m(x - x_1)$
$y - (-10) = -2(x - 2)$
$y + 10 = -2x + 4$
$-10 \qquad -10$

Slope intercept form $\rightarrow$ $y = -2x - 6$

2/13/19

3.6 Mathematical Models: Building Functions

- Problem 1+2

pg. 58

$P = (x, y)$ on $y = \sqrt{x}$

(a) distance from P to (1.75, 0)?

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$d = \sqrt{(x - 1.75)^2 + (y - 0)^2}$

$d = \sqrt{x^2 - 3.5x + 3.0625 + y^2}$

* Math will be easier if you make x, y = 0.2

Side Work:

$(x - 1.75)^2$

$(x - 1.75)(x - 1.75)$

$x^2 - 1.75x - 1.75x + 3.0625$

$x^2 - 3.5x + 3.0625$

$(y - 0)^2$

y^2