Week 2 Monday

January 14, 2019 7:29 AM

Quiz tomorrow 1.2

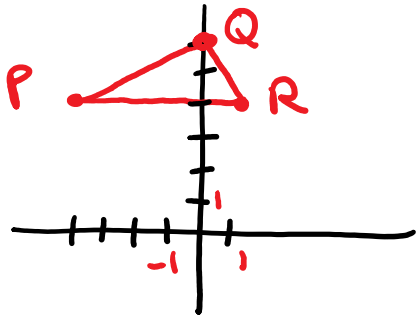
2.1 Distance and Midpoint

Distance between (x_1, y_1) and (x_2, y_2)

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

Ex: Form a triangle from $P(-4,4)$ $Q(0,6)$ and $R(1,4)$

a) Find each side length



$$d(P,Q) = \sqrt{(4)^2 + (2)^2} = \sqrt{20} \text{ or } 2\sqrt{5}$$

$$d(Q,R) = \sqrt{(1)^2 + (-2)^2} = \sqrt{5}$$

$$d(P,R) = 5$$

b) Is it a right triangle?

Check if $a^2 + b^2 = c^2$ (c = longest side)

$$(2\sqrt{5})^2 + (\sqrt{5})^2 = 5^2 \ ?$$

$4.5 + 5 = 25$?

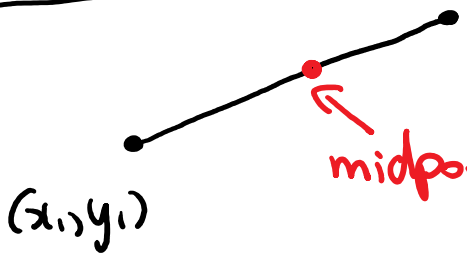
YES

c) Find the area

$A = \frac{1}{2}bh$

$= \frac{1}{2}(2\sqrt{5})(\sqrt{5})$

$= 5$



The midpoint is $M = \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

Ex: The midpoint of the line segment from $(-8, 7)$ to P is $(-6, 6)$. Find P.

(x_1, y_1) Let $P = (x_2, y_2)$ M

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$(-6, 6) = \left(\frac{-8 + x_2}{2}, \frac{7 + y_2}{2} \right)$$

x:

$$-6 = \frac{-8 + x_2}{2}$$

$$-12 = -8 + x_2$$

$$-4 = x_2$$

y:

$$6 = \frac{7 + y_2}{2}$$

$$12 = 7 + y_2$$

$$5 = y_2$$

$$P = (-4, 5)$$

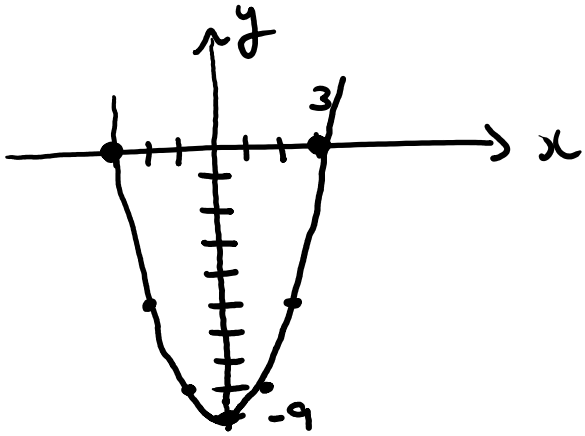
2.2 Graphs and Intercepts

- Intercepts
- Common Graphs
- Symmetry

Ex: Graph $y = x^2 - 9$

x	$y = x^2 - 9$
-3	$(-3)^2 - 9 = 0$
-2	-5
-1	-8
0	-9
1	-8
2	-5

1	-8
2	-5
3	0



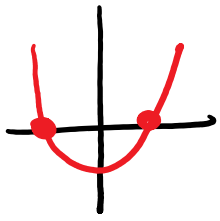
Is (4,7) on the graph?

$x=4$
$y=7$ $\rightarrow$ $y = x^2 - 9$

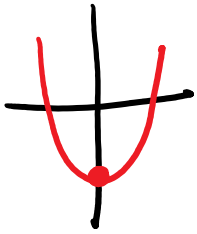
$7 = 4^2 - 9$?

Yes

INTERCEPTS



x-intercepts ($y=0$)



y-intercept ($x=0$)

Ex: $y = 6 + x - x^2$

Find all intercepts and graph

y-intercept : (set $x=0$)

$y=6$

$(0,6)$

x-intercepts : (set $y=0$)

$0=6+x-x^2$

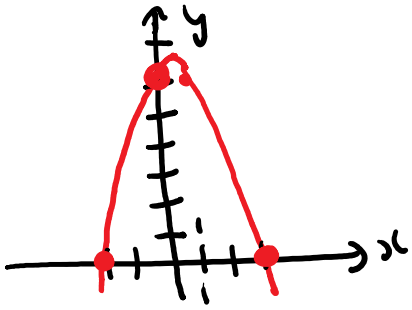
$0=-(x^2-x-6)$

$0=-(x-3)(x+2)$

$x=3,-2$

As points : $(3,0)$, $(-2,0)$

Graph:



x	$y=6+x-x^2$
0.5	6.25
1	6