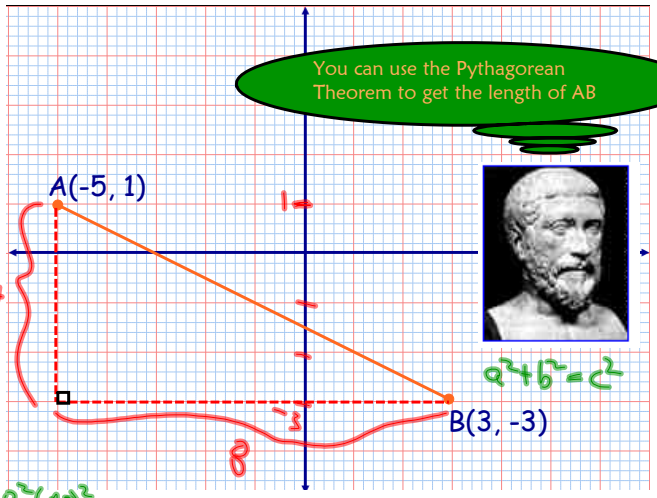
Distance between two points



$4^2+8^2=(AB)^2$
$16+64=(AB)^2$
$\sqrt{80}=\sqrt{(AB)^2}$
$\sqrt{80}=AB$

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

$AB=8.9$ OR $AB=\sqrt{4}\times\sqrt{20}=2\sqrt{20}=2(\sqrt{4}\times\sqrt{5})=4\sqrt{5}$

$\sqrt{16}\times\sqrt{5}$
$4\sqrt{5}$

Review of Operations with Radicals

Simplifying

Examples...

#1. Use the distance formula to show that the triangle with vertices A(-3, 1); B(1, 7) & C(5, 1) is isosceles.

$AB=\sqrt{(-3-1)^2+(1-7)^2}$
$AB=\sqrt{16+36}$
$AB=\sqrt{52}$
$AB=2\sqrt{13}$

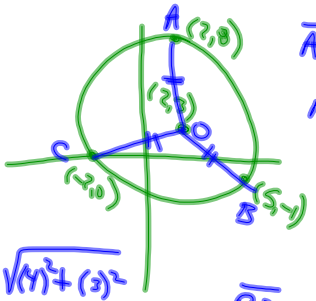
$BC=\sqrt{(5-1)^2+(7-1)^2}$
$BC=\sqrt{16+36}$
$BC=\sqrt{52}$

$BC=\sqrt{4\times13}$
$BC=2\sqrt{13}$

$AC=\sqrt{(-3-5)^2+(1-1)^2}$
$AC=\sqrt{64+0}$
$AC=8$

$AB=BC$ ∴ isosceles

#2. Show that the points (5, -1); (2, 8) & (-2, 0) lie on a circle whose center is (2, 3)



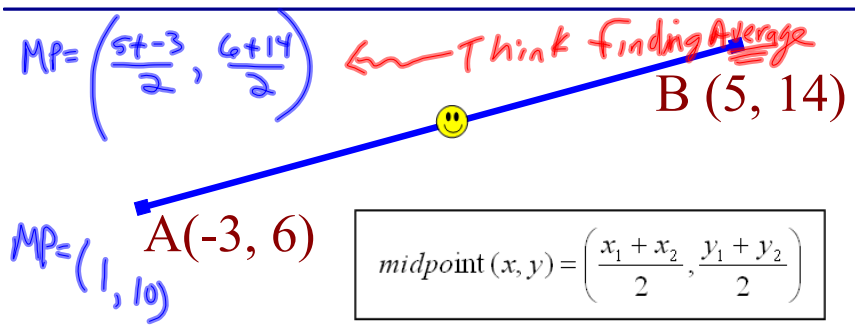
$\overline{AO}=\sqrt{(0)^2+(5)^2}$
$\overline{AO}=\sqrt{25}$
$AO=5$

$\overline{OC}=\sqrt{(4)^2+(3)^2}$
$\overline{OC}=\sqrt{16+9}$
$\overline{OC}=\sqrt{25}$

$\overline{BO}=\sqrt{(3)^2+(-4)^2}$
$\overline{BO}=\sqrt{9+16}$

ALL are equidistant from (2,3)

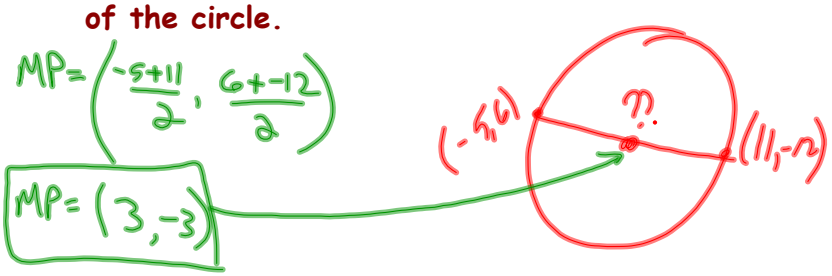
Midpoint of a Line



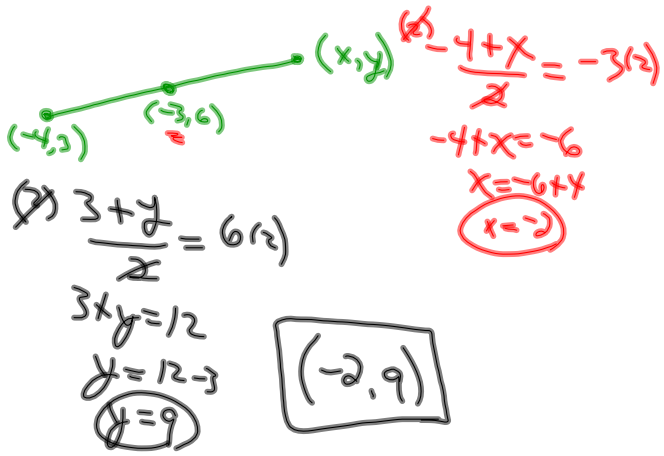
$$midpoint\,(x,y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

Examples...

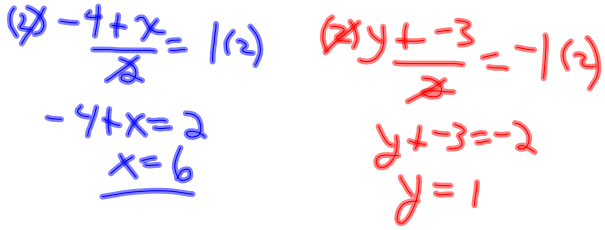
#1. The endpoints of a diameter of a circle are (-5,6) and (11,-12). Find the coordinates of the center of the circle.



#2. One endpoint of a line segment is (-4,3). The midpoint is (-3,6). Find the other endpoint.



#3. If the line segment joining (-4,y) to (x, -3) is bisected at (1,-1), find the value of x and y.

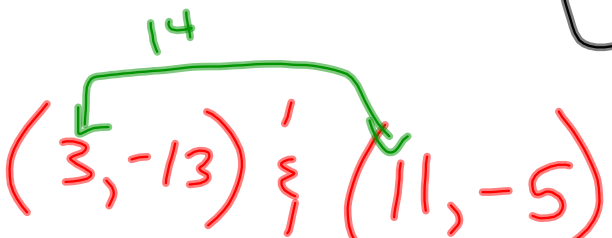


$(-7, 10)$ $(3, -12)$

MP = ??

$$MP = \left(\frac{-7+3}{2}, \frac{10+-12}{2}\right)$$

$MP = (-2, -1)$



$(7, -9)$

Homework...

Worksheet - Distance and Midpoint.doc

Sec. 6.6

2 (b) , (d)

#5 (b)

6, 7, 8, 9, 10

Sec. 6.7

1 (b), (c), (e), (g)

#3, 4, 5, 6