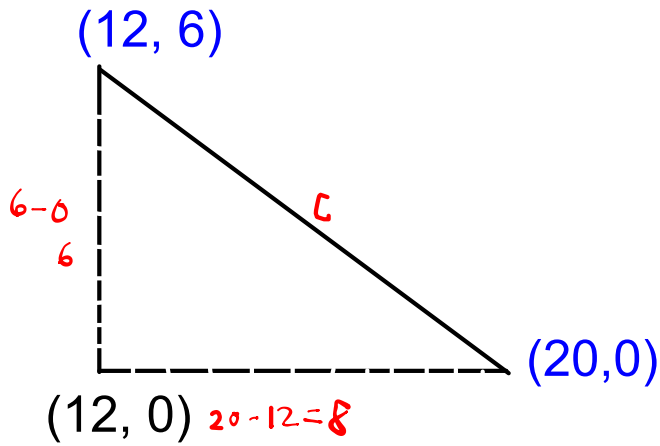
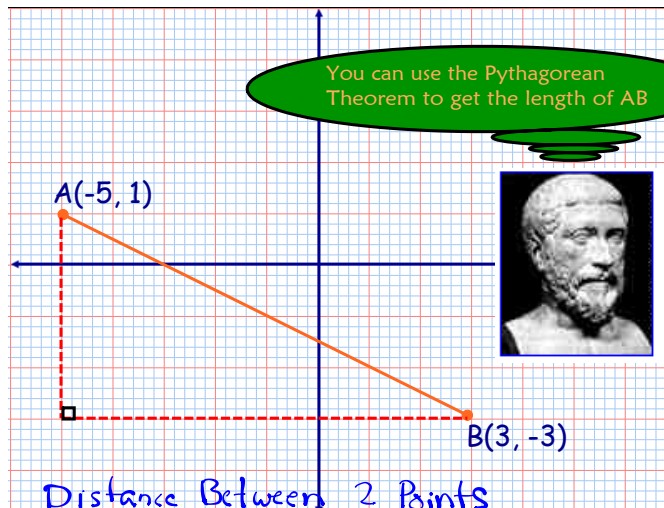


Find the distance between (12, 6) and (20, 0).



$$\begin{aligned}
 c^2 &= a^2 + b^2 \\
 &= 6^2 + 8^2 \\
 &= 36 + 64 \\
 &= 100 \\
 c &= \sqrt{100} \\
 &= 10
 \end{aligned}$$

Distance between two points



Distance Between 2 Points

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

Example:

$$\begin{aligned}
 d(AB) &= \sqrt{(-5-3)^2 + (1-(-3))^2} \\
 &= \sqrt{(-8)^2 + 4^2} \\
 &= \sqrt{64+16} \\
 &= \sqrt{80} \\
 &= 8.9 \quad 4\sqrt{5}
 \end{aligned}$$

$$\begin{aligned}
 &\sqrt{80} \\
 &\quad \downarrow \\
 &\sqrt{16 \times 5} \\
 &\quad \downarrow \\
 &4\sqrt{5}
 \end{aligned}$$

Examples...

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

$$\overline{AC} = 5 - (-3) = 8$$

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

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

$$= \sqrt{(-4)^2 + (-6)^2}$$

$$= \sqrt{16 + 36}$$

$$= \sqrt{52}$$

$$= 2\sqrt{13}$$

$$\approx 7.2$$

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

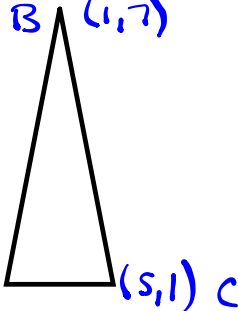
$$= \sqrt{(-4)^2 + (6)^2}$$

$$= \sqrt{16 + 36}$$

$$= \sqrt{52}$$

$$\approx 7.2$$

The Δ is isosceles.



#2. Find the distance between $A(-2, 1)$ & $B(8, 3)$

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

$$= \sqrt{(8 - (-2))^2 + (3 - 1)^2}$$

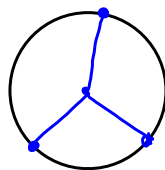
$$= \sqrt{10^2 + 2^2}$$

$$= \sqrt{104}$$

$$= \sqrt{4 \times 26}$$

$$= 2\sqrt{26}$$

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



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

$$d(AO) = \sqrt{(5 - 2)^2 + (-1 - 3)^2}$$

$$= \sqrt{9 + 16}$$

$$= \sqrt{25}$$

$$= 5$$

$$d(BO) = \sqrt{(2 - 2)^2 + (8 - 3)^2}$$

$$= \sqrt{0 + 25}$$

$$= 5$$

$$d(CO) = \sqrt{(-2 - 2)^2 + (0 - 3)^2}$$

$$= \sqrt{(-4)^2 + (-3)^2}$$

$$= \sqrt{16 + 9}$$

$$= \sqrt{25}$$

$$= 5$$

Homework...

Worksheet - Distance_Midpoint(2).pdf

Sec. 6.6 - LEFT SIDE

2 (a), (b), (d) 2. Distance from the origin

#4 a) (6,8) b) (-1,8) d) $\sqrt{3}$

6 4. Distance from (1,4)

a) (-1,7) b) (-2,6) c) (4,6)

6. \triangle P(-1,2) Q(2,6) R(-4,4)

a) Find the perimeter

b) Classify the \triangle .

Attachments

Worksheet - Distance_Midpoint(2).pdf