

1.3 More Examples: (Please put your work on the same sheet as your homework. NOT ON THIS SHEET.)

1. Find and label the length of each side of the triangle. Then, find and label the midpoint of each side of the triangle. Show all work.

$$AB = \sqrt{(6+4)^2 + (5-3)^2} = \sqrt{10^2 + 2^2} = \sqrt{104} = 2\sqrt{26} u$$

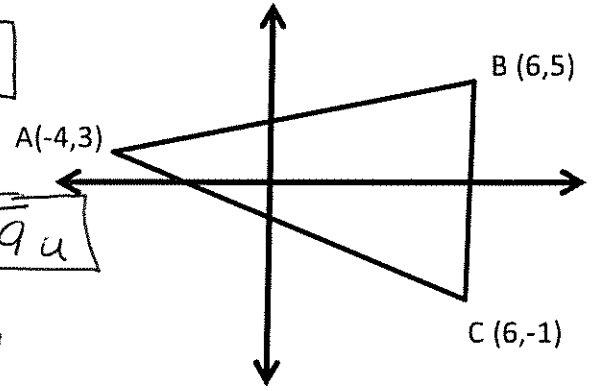
$$BC = \sqrt{(6-6)^2 + (-1-5)^2} = \sqrt{0 + (-6)^2} = \sqrt{36} = 6u$$

$$AC = \sqrt{(6+4)^2 + (-1-3)^2} = \sqrt{10^2 + (-4)^2} = \sqrt{116} = 2\sqrt{29} u$$

$$\text{Midpoint of } AB = \left(\frac{-4+6}{2}, \frac{3+5}{2}\right) = \left(\frac{+2}{2}, \frac{8}{2}\right) = (1, 4)$$

$$\text{Midpoint of } BC = \left(\frac{6+6}{2}, \frac{5+(-1)}{2}\right) = \left(\frac{12}{2}, \frac{4}{2}\right) = (6, 2)$$

$$\text{Midpoint of } AC = \left(\frac{-4+6}{2}, \frac{3+(-1)}{2}\right) = \left(\frac{2}{2}, \frac{2}{2}\right) = (1, 1)$$



2. Use the distance formula to show that $\triangle DOG$ is an equilateral

if $D = (6, 0)$, $O = (0, 0)$, and $G = (3, 3\sqrt{3})$.

Use exact answers (do not round.)

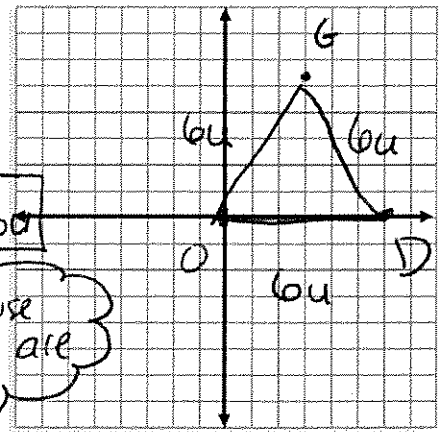
Graph the triangle and label lengths.

$$DO = \sqrt{6^2 + 0^2} = 6u$$

$$OG = \sqrt{3^2 + (3\sqrt{3})^2} = \sqrt{9 + 27} = \sqrt{36} = 6u$$

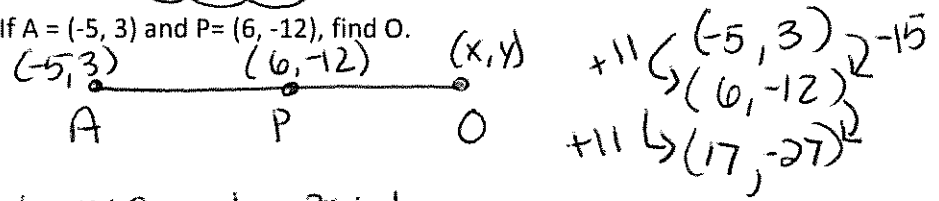
$$GD = \sqrt{(6-3)^2 + (0-3\sqrt{3})^2} = \sqrt{9 + 27} = 6u$$

Equilateral because all side lengths are 6 units.



3. We are given that P is the midpoint of \overline{AO} . If $A = (-5, 3)$ and $P = (6, -12)$, find O.

$$O = (17, -27)$$

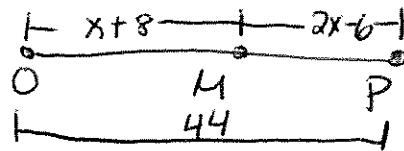


4. Given: M is between O and P on \overline{OP}

$$OM = x + 8 = 14 + 8 = 22$$

$$MP = 2x - 6 = 2(14) - 6 = 22$$

$$OP = 44$$



$$x + 8 + 2x - 6 = 44$$

$$3x + 2 = 44$$

$$3x = 42$$

$$\frac{3x}{3} = \frac{42}{3}$$

$$x = 14$$

Is M the midpoint of \overline{OP} ?

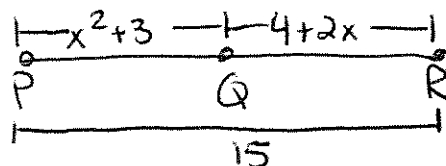
Yes, M is the midpoint because $OM = MP$.

5. Given: Q is between P and R on \overline{PR} .

$$PQ = x^2 + 3$$

$$QR = 4 + 2x$$

$$PR = 15$$



$$x^2 + 3 + 4 + 2x = 15$$

$$x^2 + 2x + 7 = 15$$

$$x^2 + 2x - 8 = 0$$

$$(x+4)(x-2) = 0$$

$$x = -4 \quad x = 2$$

a.) Find the value of x. $x = 2$

b.) Is Q the midpoint of \overline{PR} ?

NO, Q is not the midpoint because $PQ \neq QR$

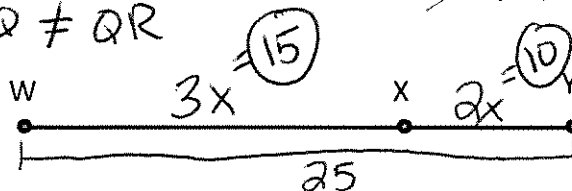
6. Given: The ratio of WX to XY is 3:2 and $WY = 25$.

Find: WX

$$3x + 2x = 25$$

$$5x = 25$$

$$x = 5$$



$$WX = 15u$$