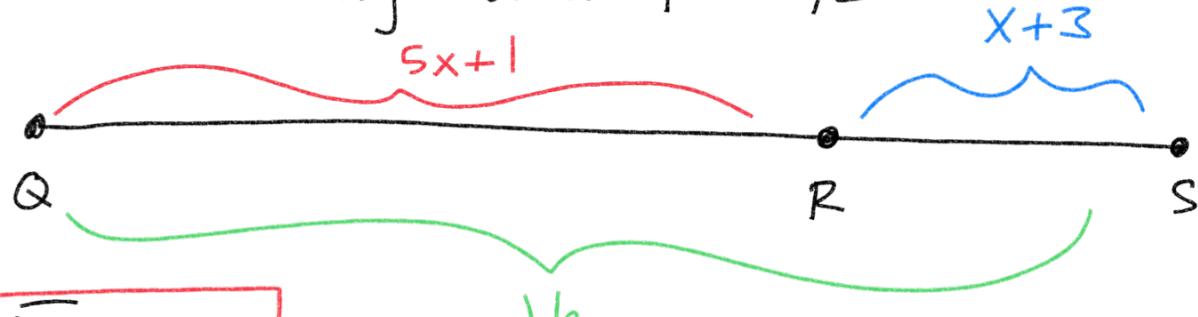


M-G Geometry Week 4 10/2



$$\overline{QR} = 5x + 1$$

$$\overline{RS} = x + 3$$

$$\overline{QS} = 16$$

Find the length of  $\overline{QR}$

$$\overline{QR} = 5x + 1$$

$$x = 2$$

$$5(2) + 1 = 10 + 1 = \boxed{11}$$

Segment Addition Postulate

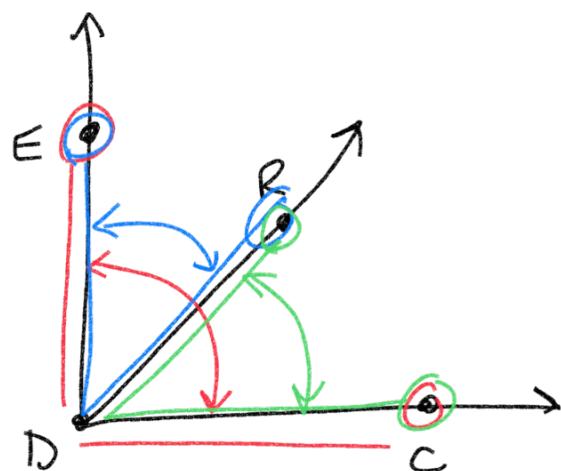
$$\overline{QR} + \overline{RS} = \overline{QS}$$

$$\underbrace{5x + 1}_{6x + 4} + \underbrace{x + 3}_{-4} = 16$$

$$\begin{array}{rcl} 6x + 4 & = & 16 \\ -4 & & -4 \end{array}$$

$$\frac{6x}{6} = \frac{12}{6}$$

$$\boxed{x = 2}$$



$$\angle EDC = 8x + 13$$

$$\angle EDR = 3x + 3$$

$$\angle RDC = 55^\circ$$

Find  $\angle EDC$

$$\angle EDC = 8x + 13$$

$$x = 9$$

$$8(9) + 13$$

$$72 + 13 = \boxed{85}$$

Angle Addition Postulate

$$\angle RDC + \angle EDR = \angle EDC$$

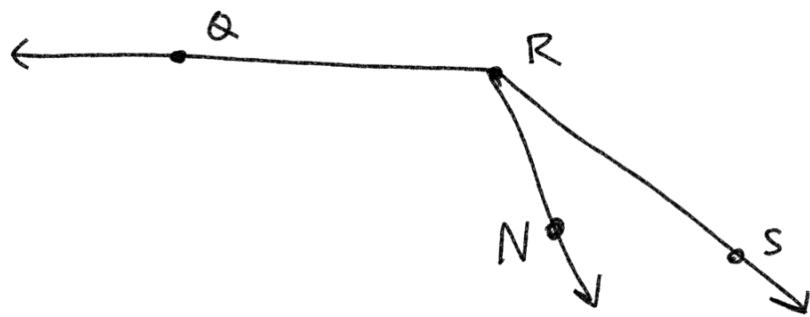
$$\downarrow \quad \downarrow \quad \downarrow$$

$$55^\circ + 3x + 3 = 8x + 13$$

$$\begin{array}{rcl} 3x + 58 & = & 8x + 13 \\ -13 & & -13 \end{array}$$

$$\begin{array}{rcl} 3x + 45 & = & 8x \\ -3x & & -3x \end{array}$$

$$\frac{45}{5} = \frac{5x}{5} \quad \boxed{X = 9}$$



$$\angle SRN = 8x$$

$$\angle NRQ = 42x + 5$$

$$\angle SRQ = 155^\circ$$

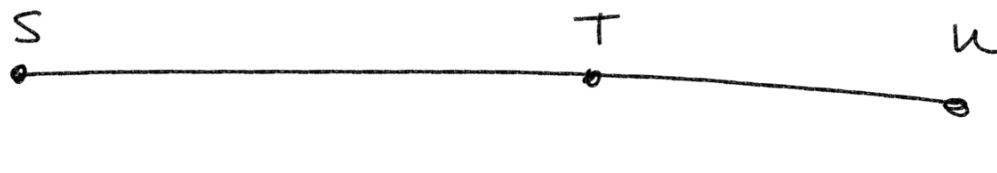
$$\angle NRQ + \angle SRN = \angle SRQ$$

$$42x + 5 + 8x = 155^\circ$$

$$50x + 5 = 155$$

$$\frac{50x}{50} = \frac{150}{50}$$

$$x = 3$$



$$\overline{ST} = 8x + 1$$

$$\overline{TU} = 3x - 1$$

$$\overline{SU} = 11$$

$$\overline{TU} + \overline{ST} = \overline{SU}$$

↓

$$3x - 1 + 8x + 1 = 11$$

$$\frac{11x}{11} = \frac{11}{11}$$

$$x = 1$$

# Distance Formula

- Pythagorean Theorem

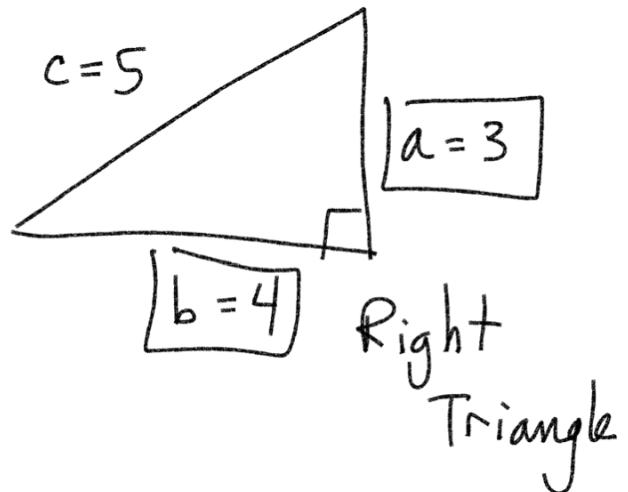
$$a^2 + b^2 = c^2$$

$$3^2 + 4^2 = c^2$$

$$9 + 16 = c^2$$

$$\sqrt{25} = \sqrt{c^2}$$

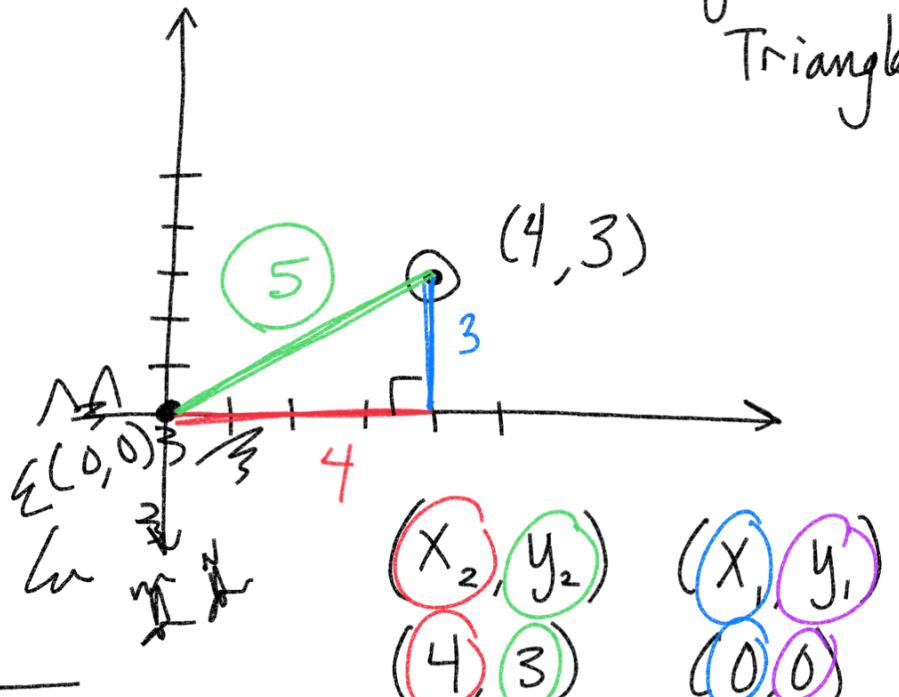
$$5 = c$$



# Distance Formula

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

difference of x's      difference of y's



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

$$\sqrt{(4-0)^2 + (3-0)^2}$$

If you change the order

$$\sqrt{(0-4)^2 + (0-3)^2}$$

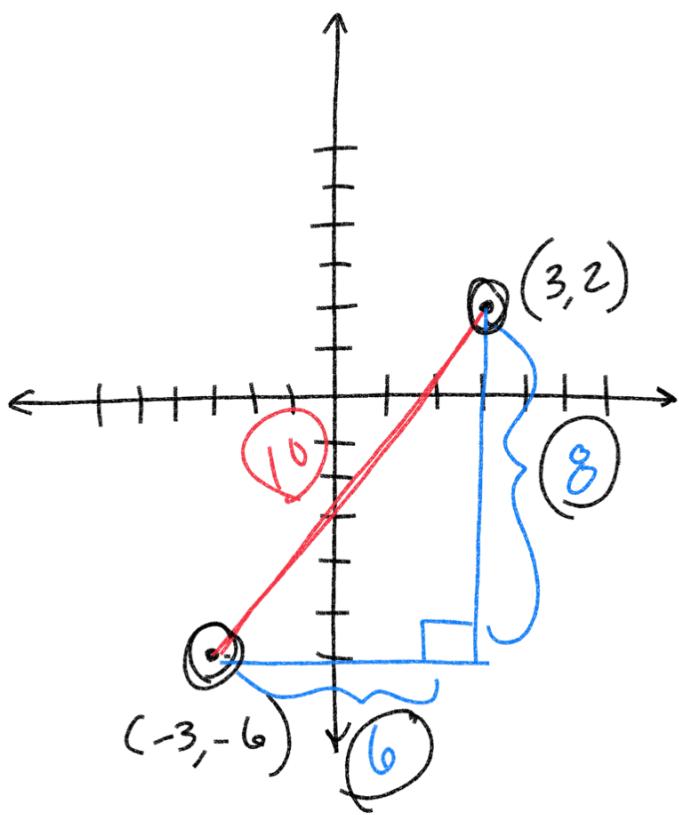
$$\sqrt{(-4)^2 + (-3)^2}$$

$$\sqrt{16 + 9} = \sqrt{25} = 5$$

$$\sqrt{4^2 + 3^2}$$

$$\sqrt{16 + 9}$$

$$\sqrt{25} = 5$$



1st  
2nd  
 $(x_1, y_1)$        $(x_2, y_2)$   
 $(3, 2)$        $(-3, -6)$

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

$$\sqrt{(-3 - 3)^2 + (-6 - 2)^2}$$

$$\sqrt{(-6)^2 + (-8)^2}$$

$$\sqrt{36 + 64}$$

$$\sqrt{100} = \boxed{10}$$

Find the distance between the points

$$(x_1, y_1) \text{ and } (x_2, y_2)$$

Factor out perfect squares  
1, 4, 9, 16, 25, 36, 49, 64, 81, 100

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

$$\sqrt{(2 - 5)^2 + (8 - 2)^2}$$

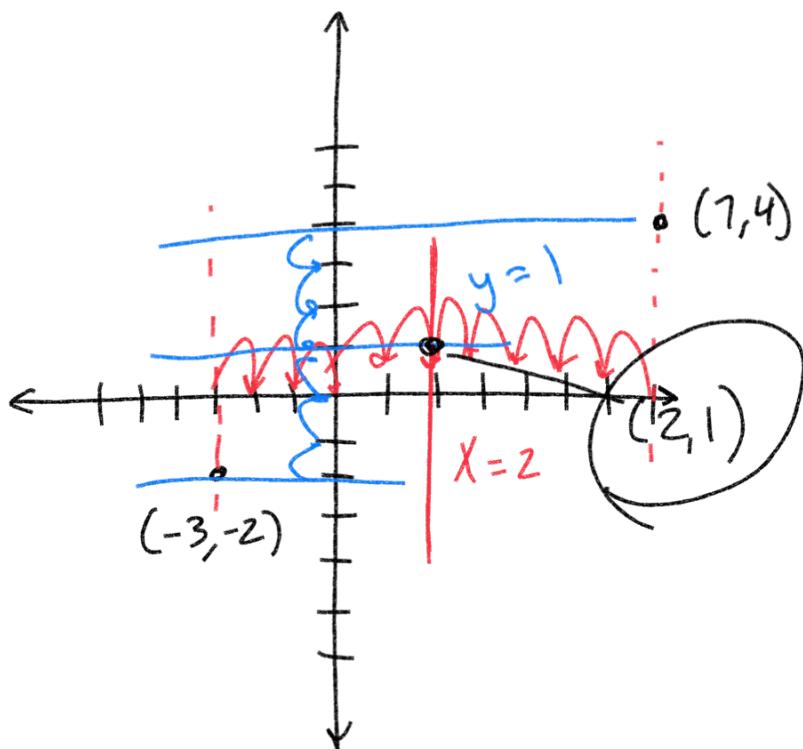
$$\sqrt{(-3)^2 + (6)^2}$$

$$\sqrt{9 + 36} = \sqrt{45}$$

$$\begin{array}{c} \sqrt{45} \\ \swarrow \searrow \\ \sqrt{9} \cdot \sqrt{5} \end{array}$$

$$\boxed{3\sqrt{5}}$$

## Midpoint



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

(Average of Average of  
x, y)

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

$$\left( \frac{7 + (-3)}{2}, \frac{4 + (-2)}{2} \right)$$

$$\left( \frac{4}{2}, \frac{2}{2} \right)$$

$$\underline{(2, 1)}$$

Find the midpoint  
(8, 5) and (-2, -3)

Midpoint formula

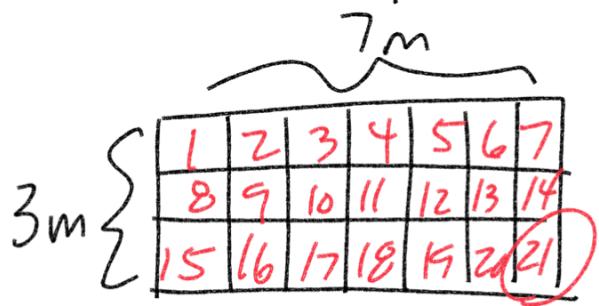
$$\left( \frac{x_2 + x_1}{2}, \frac{y_2 + y_1}{2} \right)$$

$$\left( \frac{-2 + 8}{2}, \frac{5 + (-3)}{2} \right)$$

$$\left( \frac{6}{2}, \frac{2}{2} \right)$$

$$\underline{(3, 1)}$$

# 1-7 Area & Perimeter

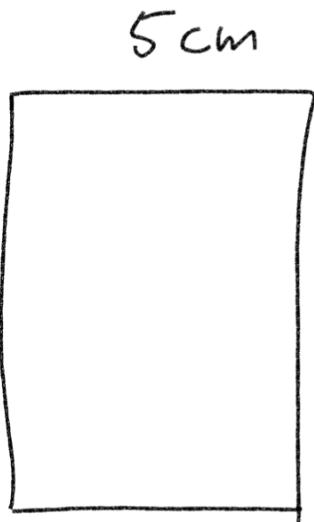


Area = Length \* height

$$(7\text{ m})(3\text{ m}) = \boxed{21\text{ m}^2}$$

Perimeter =  $2L + 2H$

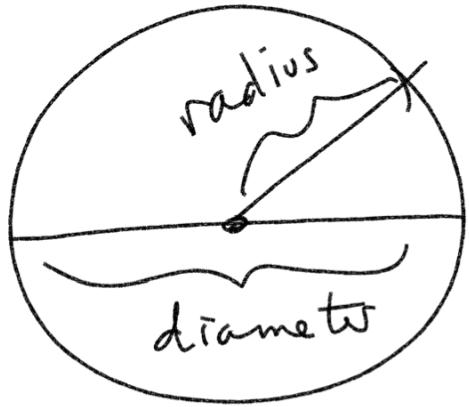
$$2(7\text{ m}) + 2(3\text{ m}) \\ 14\text{ m} + 6\text{ m} = \boxed{20\text{ m}}$$



$$A = (5\text{ cm})(12\text{ cm}) = \boxed{60\text{ cm}^2}$$

$$P = 2(5\text{ cm}) + 2(12\text{ cm})$$

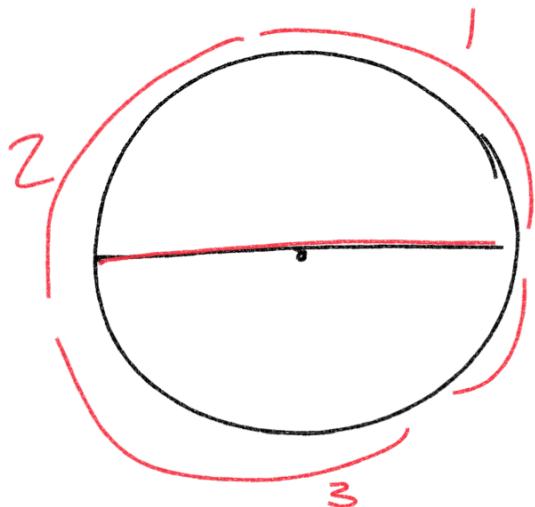
$$\overbrace{10\text{ cm} + 24\text{ cm}}^{34\text{ cm}}$$



$\frac{1}{2}$  diameter = 1 radius

$$\frac{1}{2}d = r$$

$$d = 2r$$



Idea: The number of times the diameter wraps around the circumference of a circle is  $\pi$ .



Circumference

$$C = \pi d$$

$$= \pi(12\text{ in}) = \boxed{12\pi \text{ in}}$$

$(12\pi)$

Area of a circle

$$A = \pi r^2$$

$$A = \pi (6\text{ cm})^2$$

$$\pi (36\text{ cm}^2) = \boxed{36\pi \text{ cm}^2}$$



$$C = \pi d$$

$$C = \pi(2r)$$

$$\pi(2)(6\text{ cm})$$

$$\boxed{12\pi \text{ cm}}$$