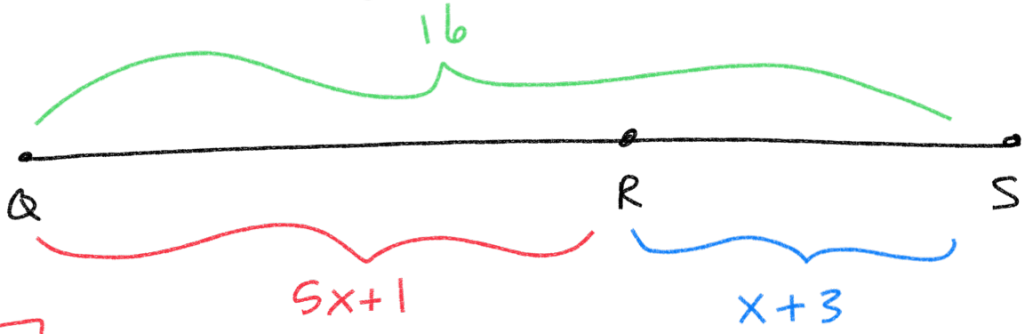
T-G Geometry Week 4 9/26



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

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

$\boxed{\overline{QS}} = 16$

Find the length of $\overline{QR}$.

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

$x=2 \quad 5(2)+1$

$10+1 = \boxed{11}$

Segment Addition Postulate (SAP)

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

$$\downarrow \qquad \downarrow \qquad \downarrow$$

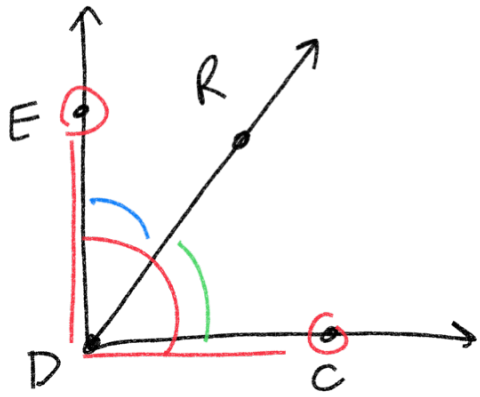
$$\underbrace{5x+1+x+3} = 16$$

$$6x+4 = 16$$

$$-4 \qquad -4$$

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

$$\boxed{x=2}$$



$\boxed{\measuredangle EDC = 8x+13}$

$\boxed{\measuredangle EDR = 3x+3}$

$\boxed{\measuredangle RDC = 55^\circ}$

Angle Addition Postulate (AAP)

$$\measuredangle RDC + \measuredangle EDR = \measuredangle EDC$$

$$\downarrow \qquad \downarrow \qquad \downarrow$$

$$55 + 3x+3 = 8x+13$$

$$3x+58 = 8x+13$$

$$-13 \qquad -13$$

$$3x+45 = 8x$$

$$-3x \qquad -3x$$

$$\frac{45}{5} = \frac{5x}{5}$$

$$\boxed{x=9}$$

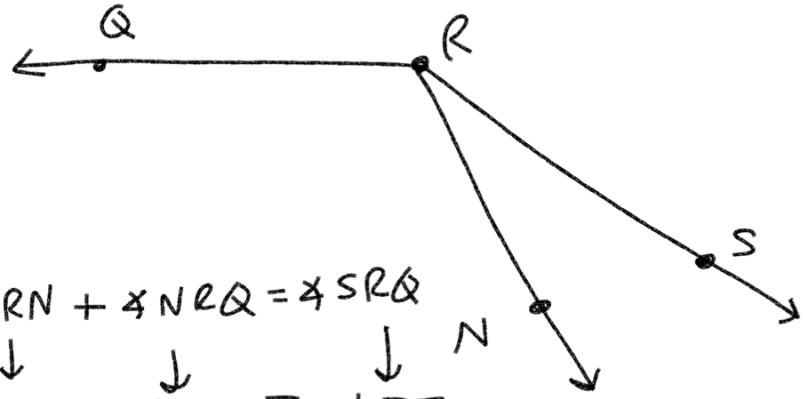
Find $\measuredangle EDC$

$8x+13$

$x=9$

$8(9)+13$

$72+13 = \boxed{85}$



$\measuredangle SRN = 8x$

$\measuredangle NRQ = 42x + 5$

$\measuredangle SRQ = 155°$

$\measuredangle SRN + \measuredangle NRQ = \measuredangle SRQ$

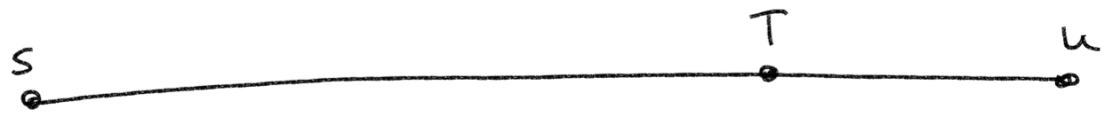
$8x + 42x + 5 = 155$

$50x + 5 = 155$

$\quad -5 \quad -5$

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

$\boxed{x = 3}$



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

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

$\overline{SU} = 11$

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

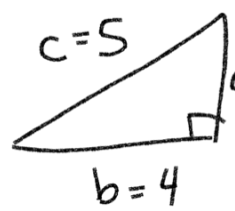
$8x+1 + 3x-1 = 11$

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

$\boxed{x = 1}$

Distance Formula

- Pythagorean Theorem



Right Triangle

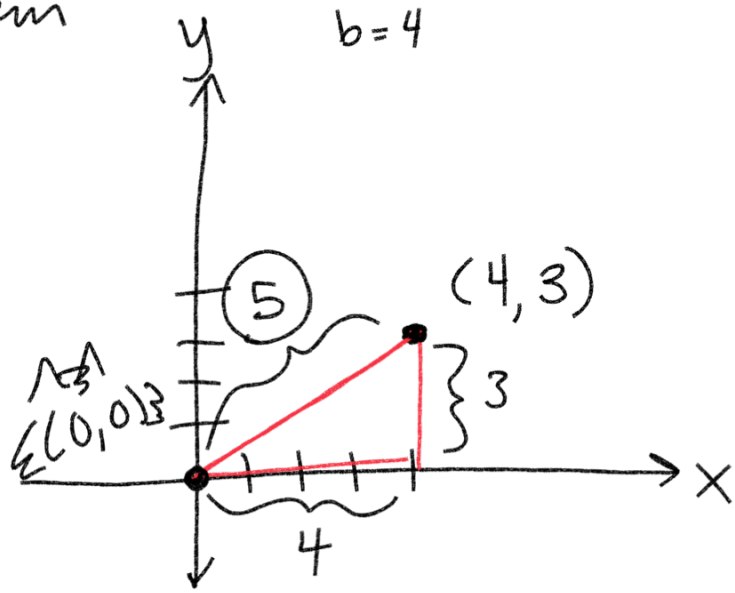
$a^2 + b^2 = c^2$

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

$9 + 16 = c^2$

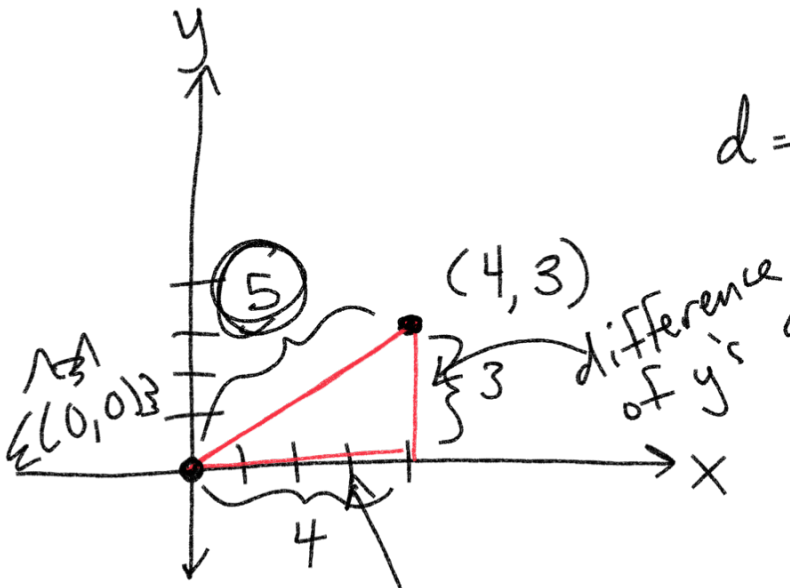
$\sqrt{25} = \sqrt{c^2}$

$5 = c$



Distance Formula

$$d = \sqrt{\underbrace{(x_2 - x_1)}_{\text{difference of x's}}^2 + \underbrace{(y_2 - y_1)}_{\text{difference of y's}}^2}$$



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

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

$$\sqrt{25} = 5$$

$(4, 3)$ $\{(0, 0)\}$

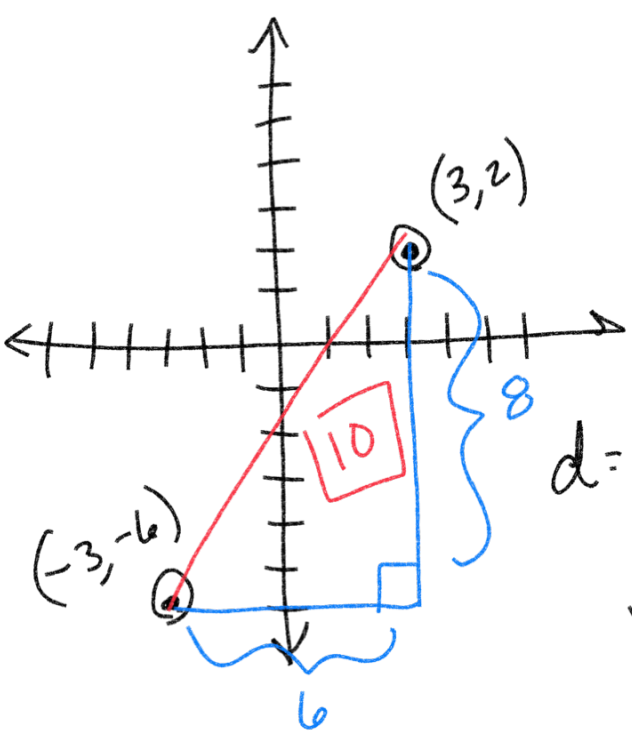
(x_2, y_2) (x_1, y_1)

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

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

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

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



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

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

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

$$\sqrt{(3+3)^2 + (2+6)^2} = \sqrt{6^2 + 8^2}$$

$$\sqrt{36 + 64}$$

what if... $\quad 1^{\underline{st}} \quad 2^{\underline{nd}}$ $\qquad \sqrt{100} = \boxed{10}$

$(3,2) \quad (-3,-6)$

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

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

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

$$\sqrt{36+64} = \sqrt{100} = \boxed{10}$$

Find the distance between the points

$(5,2)$ and $(2,8)$ $\qquad$ 1, 4, 9, 16, 25, 36, 49, 64, 81

$(x_1, y_1) \qquad (x_2, y_2)$ $\qquad$ Look for perfect square

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

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

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

$$\sqrt{9+36} = \sqrt{45} = \boxed{3\sqrt{5}}$$

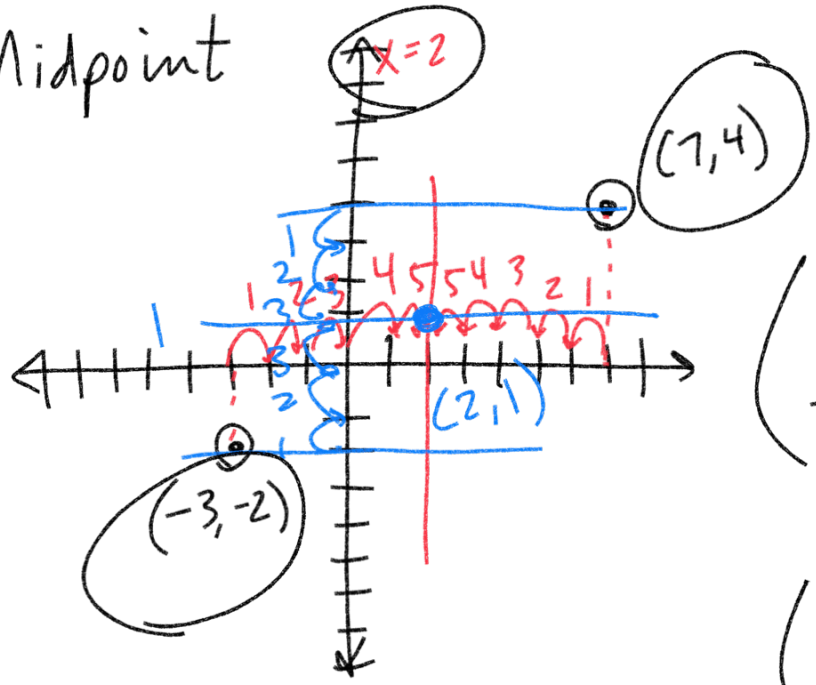
$$\sqrt{45}$$

$$\sqrt{9} \cdot \sqrt{5}$$

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

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

Midpoint



Average of x, Average of y

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

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

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

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

Find the midpoint

(8,5) and (-2,-3)

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

$$\left(\frac{6}{2}, \frac{2}{2}\right) = \boxed{(3,1)}$$

Midpoint formula

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

1-7 Area + Perimeter

9m

3m

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27

Area = Length * height

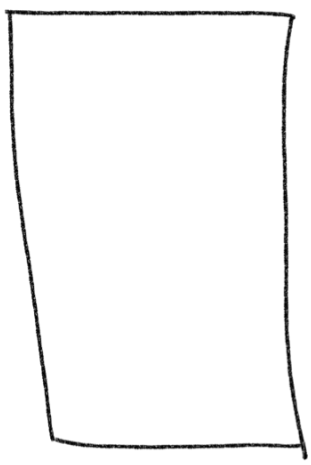
$9m * 3m = 27m^2$

Perimeter = 2L + 2H

$2(9m) + 2(3m)$

$18m + 6m = \boxed{24m}$

5cm



12cm

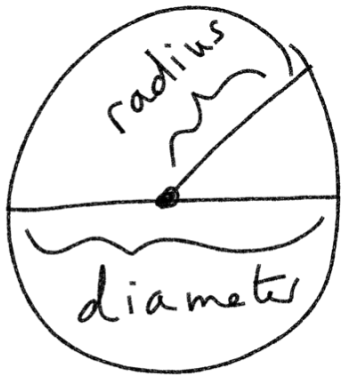
$A = (5cm)(12cm) = \boxed{60cm^2}$

$P = 2(L) + 2(H)$

$2(5cm) + 2(12cm)$

$10cm + 24cm$

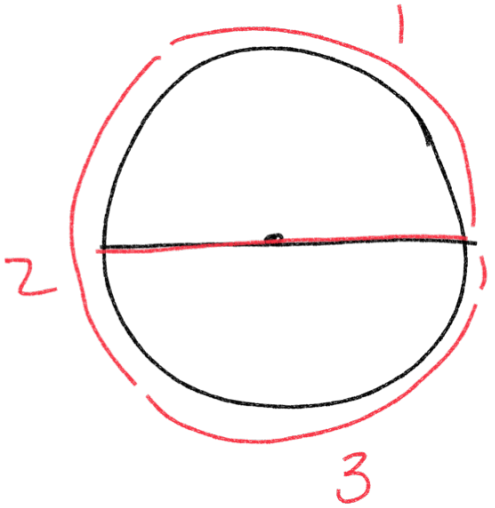
$\boxed{34cm}$



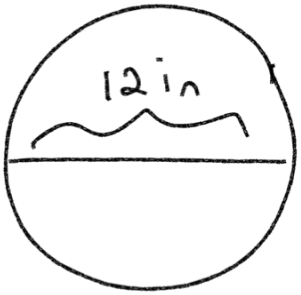
$\frac{1}{2}$ diameter = 1 radius

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

$d = 2r$



Idea: The number of times the diameter wraps around the circumference of a circle is π.



circumference

$C = \pi d$

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

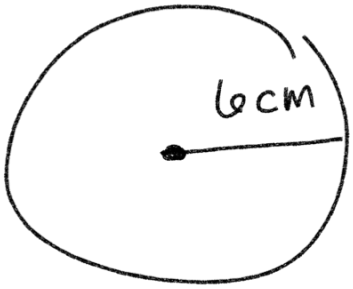
Area of a Circle

$A = \pi r^2$

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

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

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



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

$2\pi r = 2\pi(6\text{ cm}) = \boxed{12\pi \text{ cm}}$