

1. Using the function $f(x) = |x + 4| + 3$ for the following problems:

a. $f(2) = \underline{9}$
 $= |2 + 4| + 3$
 $= |6| + 3$
 $= 9$

b. $f(-6) = \underline{5}$
 $= |-6 + 4| + 3$
 $= |-2| + 3$
 $= 2 + 3$
 $= 5$

c. $f(x) = 5, x = \underline{-2}$ and $x = \underline{-6}$
 $5 = |x + 4| + 3$
 $2 = |x + 4|$
 $-2 = x + 4 \quad 2 = x + 4$
 $-6 = x \quad -2 = x$

d. $f(x) = 7, x = \underline{0}$ and $x = \underline{-8}$
 $7 = |x + 4| + 3$
 $4 = |x + 4|$
 $4 = x + 4 \quad -4 = x + 4$
 $0 = x \quad -8 = x$

2. Solve each function to find its inverse. (Switch x and y)

a. $g(x) = x^2 + 2 \quad y = x^2 + 2$
 $x = y^2 + 2$
 $x - 2 = y^2$
 $\sqrt{x - 2}$

Inverse: $g^{-1}(x) = \sqrt{x + 2}$

b. $h(x) = 3x + 9 \quad y = 3x + 9$
 $x = 3y + 9$
 $x - 9 = 3y$
 $\frac{x - 9}{3} = y$

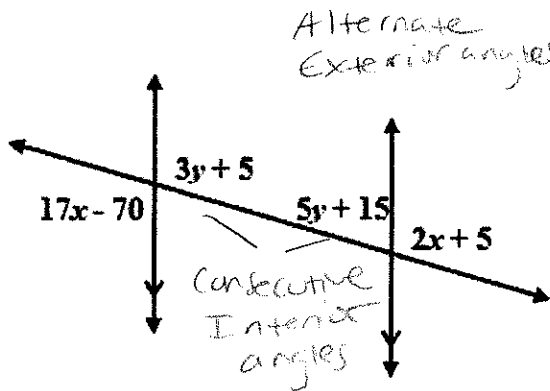
Inverse: $h^{-1}(x) = \frac{x - 9}{3}$ or $\frac{1}{3}x - 3$

c. $j(x) = \frac{1}{4}x - 5 \quad y = \frac{1}{4}x - 5$
 $x = \frac{1}{4}y - 5$
 $x + 5 = \frac{1}{4}y$
 $4(x + 5) = y$

Inverse: $j^{-1}(x) = 4(x + 5)$ or $4x + 20$

3. Find the measure of x and y in the diagram below.

$x = \underline{5}$ $y = \underline{20}$



Alternate Exterior angles \rightarrow

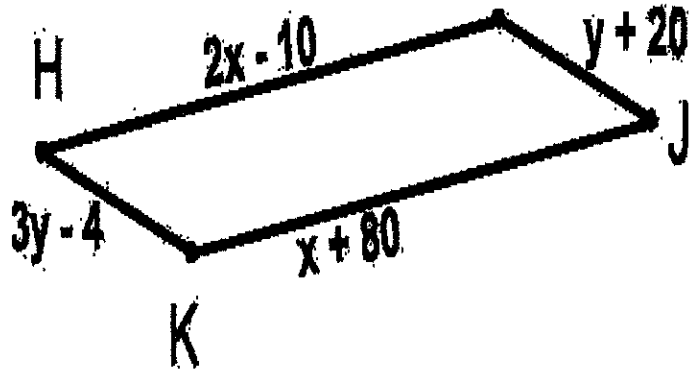
$$\begin{aligned} 2x + 5 &= 17x - 70 \\ -2x &\quad -2x \\ 5 &= 15x - 70 \\ +70 &\quad +70 \\ 75 &= 15x \\ \frac{75}{15} &= \frac{15x}{15} \\ 5 &= x \end{aligned}$$

$$\begin{aligned} 3y + 5 + 5y + 15 &= 180 \\ 8y + 20 &= 180 \\ -20 &\quad -20 \\ 8y &= 160 \\ \frac{8y}{8} &= \frac{160}{8} \\ y &= 20 \end{aligned}$$

4. Solve for x and y in this parallelogram. Show all of your work below.

$$\begin{aligned} 2x - 10 &= x + 80 \\ -x &\quad -x \\ \hline x - 10 &= 80 \\ +10 &\quad +10 \\ \hline x &= 90 \end{aligned}$$

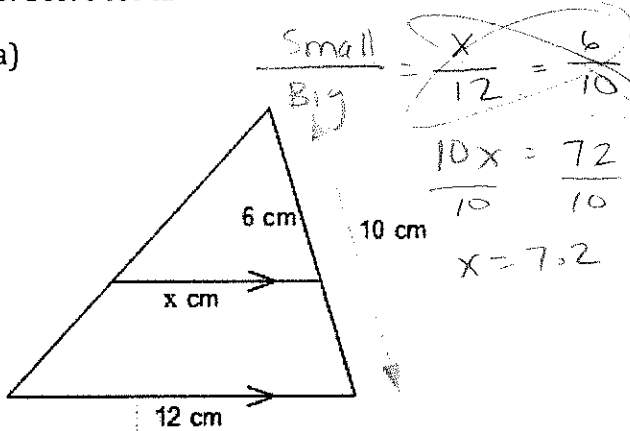
$$\begin{aligned} 3y - 4 &= y + 20 \\ -y &\quad -y \\ \hline 2y - 4 &= 20 \\ +4 &\quad +4 \\ \hline 2y &= 24 \\ \frac{2y}{2} &= \frac{24}{2} \\ y &= 12 \end{aligned}$$



x = 90 y = 12

5. Solve for x.

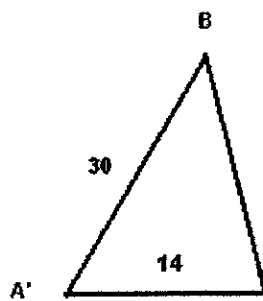
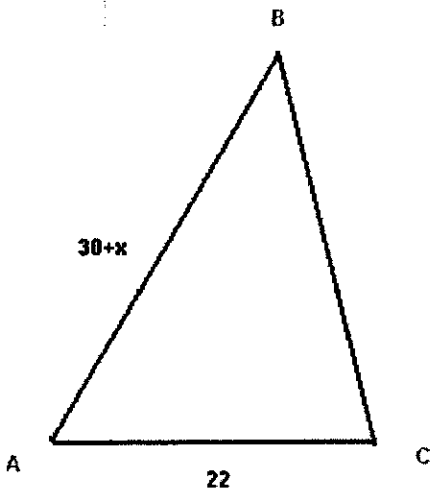
a)



$$\begin{aligned} \frac{\text{Small}}{\text{Big}} &= \frac{x}{12} = \frac{6}{10} \\ 10x &= 72 \\ \frac{10x}{10} &= \frac{72}{10} \\ x &= 7.2 \end{aligned}$$

x = 7.2 cm

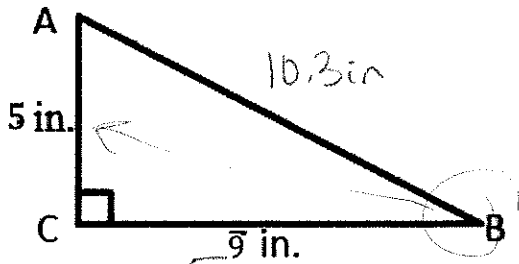
b)



$$\begin{aligned} \frac{\text{Big}}{\text{Small}} &= \frac{30+x}{30} = \frac{22}{14} \\ 14(30+x) &= 660 \\ 420 + 14x &= 660 \\ 14x &= 240 \\ \frac{14x}{14} &= \frac{240}{14} \\ x &= 17.14 \end{aligned}$$

x = 17.14

6. Find all missing sides and angles from the following triangles. Show all of your work:



$$\tan(B) = \frac{5}{9}$$

$$B = \tan^{-1}\left(\frac{5}{9}\right)$$

$$B = 29.1^\circ$$

$$5^2 + 9^2 = c^2$$

$$25 + 81 = c^2$$

$$\sqrt{106} = c$$

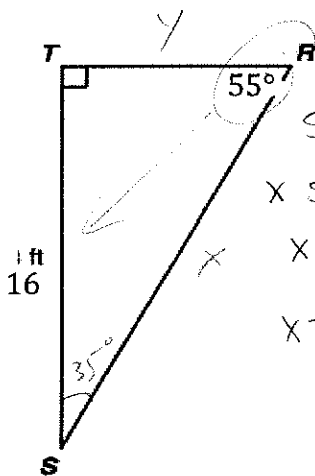
$$c = 10.3$$

$$AB = \underline{10.3 \text{ in}}$$

$$m\angle A = \underline{60.9^\circ}$$

$$m\angle B = \underline{29.1^\circ}$$

$$180 - 90 - 29.1 = 60.9$$



$$180 - 90 - 55 = 35^\circ$$

$$\sin(55) = \frac{16}{x}$$

$$x \sin(55) = 16$$

$$x = \frac{16}{\sin(55)}$$

$$x = 19.5$$

$$TR = \underline{9.2}$$

$$RS = \underline{19.5}$$

$$m\angle S = \underline{35^\circ}$$

$$\tan(35) = \frac{y}{16}$$

$$16 \tan(35) = y$$

$$9.2 = y$$

8. 6. For each problem, find the missing arc measures or angle and

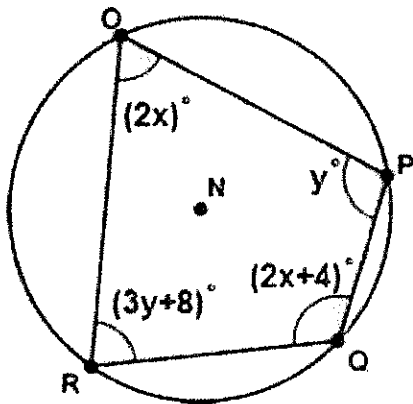
$$3y + 8 + y = 180$$

$$4y + 8 = 180$$

$$-8 \quad -8$$

$$4y = 172$$

$$y = 43$$



$$2x + 2x + 4 = 180$$

$$4x + 4 = 180$$

$$-4 \quad -4$$

$$4x = 176$$

$$\frac{4}{4} \quad \frac{176}{4}$$

$$x = 44$$

$$X = \underline{44}$$

$$Y = \underline{43}$$

$$m\angle O = \underline{88^\circ}$$

$$m\angle P = \underline{43^\circ}$$

$$m\angle Q = \underline{92^\circ}$$

$$m\angle R = \underline{137^\circ}$$

9. The circumference of a circle is 28π cm. What is the area of this circle?

$$C = 2\pi \cdot r$$

$$\frac{28\pi}{2} = \frac{2\pi r}{2}$$

$$\frac{14\pi}{\pi} = \frac{\pi r}{\pi}$$

$$14\text{cm} = r$$

$$A = \pi r^2$$

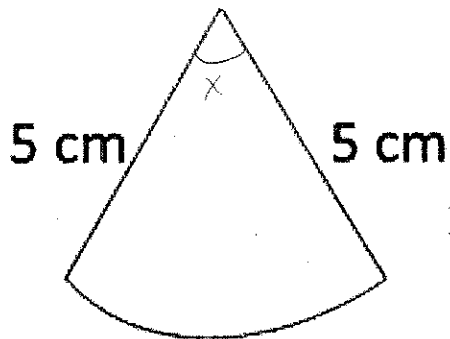
$$A = \pi (14)^2$$

$$A = 196\pi \text{cm}^2$$

Exact: $196\pi \text{cm}^2$

Approximate: 615.75cm^2

10. The area of this sector is $28\pi \text{cm}^2$. What is the measure of the arc?



$$A_{\text{sector}} = \frac{\text{angle}}{360} \cdot \pi r^2$$

$$28\pi = \frac{\text{angle}}{360} \cdot \pi (5)^2$$

$$360 \cdot 28\pi = \left(\frac{\text{angle}}{360} \cdot 25\pi \right) \cdot 360$$

$$\frac{10080\pi}{\pi} = \frac{\text{angle} \cdot 25 \cdot \pi}{\pi}$$

Arc Measure: 16.128°

$$\frac{10080}{25} = \frac{\text{angle} \cdot 25}{25}$$

$$16.128 = \text{angle}$$