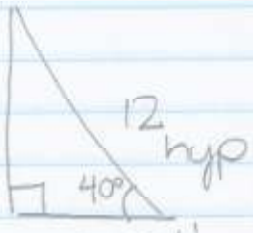
January 7th, 2008

Non Right Trangled Trig

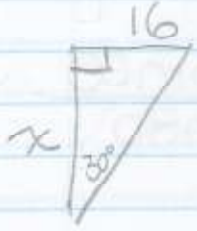
SohCahToa



$$\cos 40 = \frac{x}{12}$$

$$x = 12 \cdot \cos 40$$

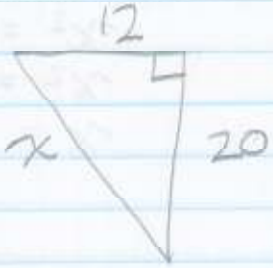
$$x = 9.2$$



$$\tan 30 = \frac{16}{x}$$

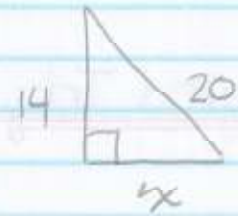
$$x = \frac{16}{\tan 30}$$

$$x = 27.7$$



$$12^2 + 20^2 = x^2$$
$$144 + 40 = x^2$$
$$544 = x^2$$
$$x = 2\sqrt{136}$$

$$x = \sqrt{544}$$
$$x = \sqrt{16}\sqrt{34}$$
$$x = 4\sqrt{34}$$



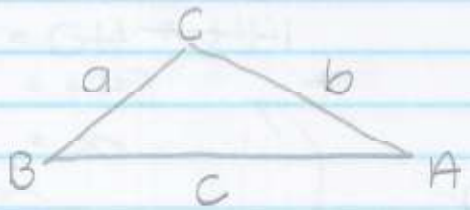
$14^2 + x^2 = 20^2$

$x^2 = 400 - 196$

$x^2 = 204$

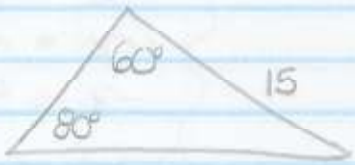
$x = 2\sqrt{51}$

Law of Sines (Sine Law)



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

Ex 1:

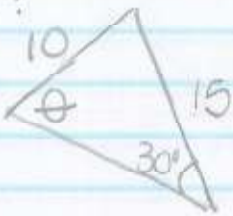


$$\frac{15}{\sin 80} = \frac{x}{\sin 60}$$

$$x = \frac{15 \cdot \sin 60}{\sin 80}$$

$$x = 13.2$$

Ex 2:



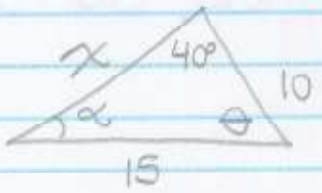
$$\frac{10}{\sin 30} = \frac{15}{\sin \theta}$$

$$\sin\theta = \frac{15 \cdot \sin 30}{10}$$

$\sin\theta = 0.75$

$\theta = 48.6°$

Ex 3: Solve for unknowns

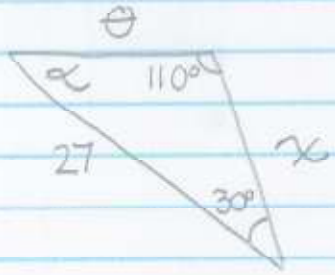
a) 

$$\frac{15}{\sin 40} = \frac{10}{\sin \alpha}$$

$$\sin \alpha = \frac{10 \cdot \sin 40}{15}$$

$$\alpha = 25.4$$

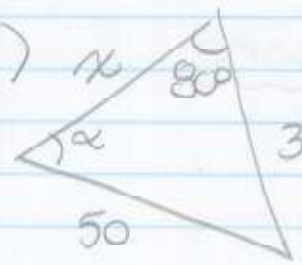
$$180 - 40 - 25.4 = \theta$$
$$\theta = 114.6$$

b) 

$$\frac{27}{\sin 110} = \frac{x}{\sin 40}$$

$$x = 18.5$$

$$180 - 110 - 30 = \alpha$$
$$40 = \alpha$$

c) 

$180° - 80° - 36.2° = 63.8°$

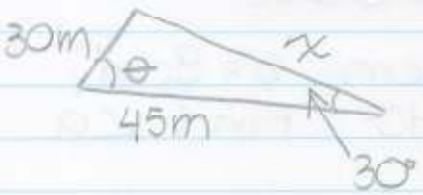
$$\frac{50}{\sin 80} = \frac{30}{\sin \alpha}$$

$\alpha = 36.2$

$$\frac{50}{\sin 80} = \frac{x}{\sin 63.8}$$

$x = 45.5$

(2)



$$\frac{30}{\sin 30} = \frac{45}{\sin \theta}$$

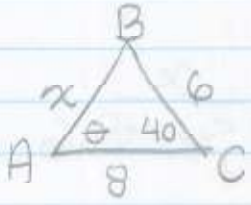
$$\theta = 48.6$$

$$\frac{30}{\sin 30} = \frac{x}{\sin 48.6}$$

(3)

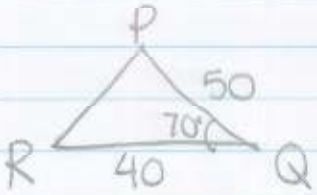
Find indicated unknown

④ In $\triangle ABC$, $a = 6cm$ $b = 8cm$
$\angle C = 40°$ Find $\angle a$



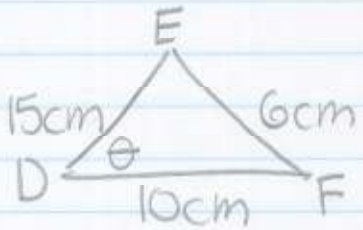
$x = 51$
$\theta = 48.6$

⑤ In $\triangle PQR$ $p = 40m$ $r = 50m$ $\angle q = 70°$
Find q



$q = 52.3m$

⑥ In $\triangle DEF$ $d = 6cm$, $e = 10cm$, $f = 15cm$
Find $\angle d$



$\theta = 15.6°$