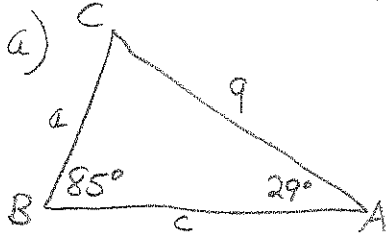


Adv. Geometry Law of Sines & Law of Cosines

key

① Round decimal answers to the nearest tenth. Solve the triangle.



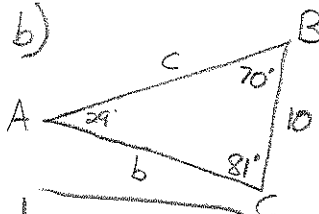
$$\angle C = 66^\circ$$

$$\frac{\sin 85^\circ}{9} = \frac{\sin 29^\circ}{a}$$

$$a = 4.4$$

$$\frac{\sin 85^\circ}{9} = \frac{\sin 66^\circ}{c}$$

$$c = 8.3$$



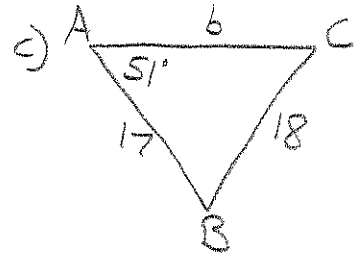
$$m\angle A = 29^\circ$$

$$\frac{\sin 29^\circ}{10} = \frac{\sin 70^\circ}{b}$$

$$b = 19.4$$

$$\frac{\sin 29^\circ}{10} = \frac{\sin 81^\circ}{c}$$

$$c = 20.4$$



$$\frac{\sin 51^\circ}{18} = \frac{\sin C}{17}$$

$$.73397 = \sin C$$

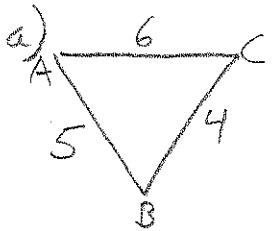
$$47.2^\circ = \angle C$$

$$\angle B = 81.8^\circ$$

$$\frac{\sin 81.8^\circ}{b} = \frac{\sin 51^\circ}{18}$$

$$b = 22.9$$

② Solve the triangle. Round the decimal answers to the nearest tenth.



$$6^2 = 5^2 + 4^2 - 2(5)(4)\cos B$$

$$\frac{-5}{-40} = \frac{-40\cos B}{-40}$$

$$\frac{1}{8} = \cos B$$

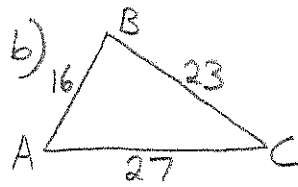
$$82.8^\circ = \angle B$$

$$\frac{\sin 82.82^\circ}{6} = \frac{\sin C}{5}$$

$$.82679 = \sin C$$

$$55.7^\circ = \angle C$$

$$\angle A = 41.41^\circ$$



$$27^2 = 23^2 + 16^2 - 2(16)(23)\cos B$$

$$\frac{-56}{-736} = \frac{-736\cos B}{-736}$$

$$.07608 = \cos B$$

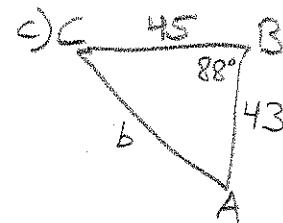
$$85.6^\circ = \angle B$$

$$\frac{\sin 85.6^\circ}{27} = \frac{\sin A}{23}$$

$$.84934 = \sin A$$

$$58.1^\circ = \angle A$$

$$\angle C = 36.3^\circ$$



$$b^2 = 45^2 + 43^2 - 2(45)(43)(\cos 88^\circ)$$

$$b^2 = 3738.9389$$

$$b = 61.1$$

$$\frac{\sin 88^\circ}{61.1} = \frac{\sin A}{45}$$

$$.73604 = \sin A$$

$$\angle A = 47.4^\circ$$

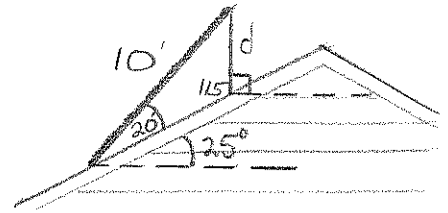
$$\angle C = 44.6^\circ$$

Solve the story problems.

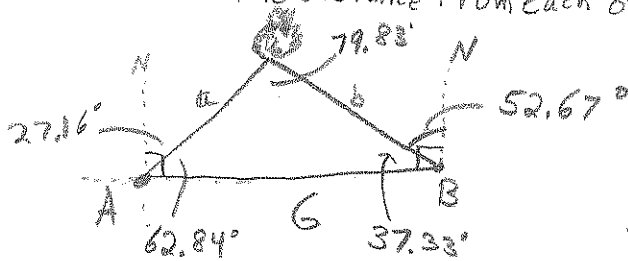
a) In the drawing is a solar panel 10 feet in width, which is to be attached to a roof that makes an angle of 25° with the horizontal. Approximate the length, d , of the brace that is needed for the panel to make an angle of 45° with the horizontal.

$$\frac{\sin 20}{d} = \frac{\sin 15}{10}$$

$$d = 3.77 \text{ ft}$$



b) A forest ranger at fire tower A sights a fire in the direction $N 27^\circ 10' E$. Another ranger in fire tower B, 6.0 miles due east of A, sights the same fire at $N 52^\circ 40' W$. Approximate the distance from each of the observation points to the fire.



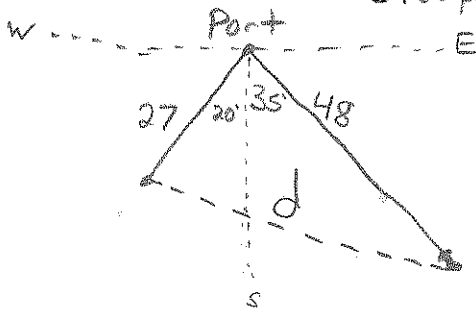
$$\frac{\sin 79.83}{6} = \frac{\sin 62.84}{b}$$

$$b = 5.42 \text{ miles from B}$$

$$\frac{\sin 79.83}{6} = \frac{\sin 37.33}{a}$$

$$a = 3.70 \text{ miles from A}$$

c) A ship leaves port at 1pm and travels $S 35^\circ E$ at a rate of 24 MPH. Another ship leaves the same port at 1:30pm and travels $S 20^\circ W$ at 18 MPH. Approximate how far apart are the ships at 3:00pm?

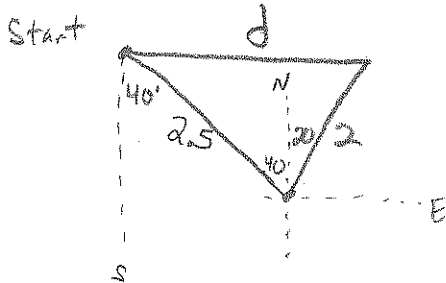


$$d^2 = 27^2 + 48^2 - 2(27)(48)(\cos 55)$$

$$d^2 = 1546.289877$$

$$d = 39.323 \text{ miles}$$

d) A jogger runs at a constant speed of one mile every 8 minutes in the direction $S 40^\circ E$ for 20 minutes and then in the direction $N 20^\circ E$ for the next 16 minutes. Approximate, to the nearest tenth of a mile, the straight-line distance from the endpoint to the starting point of the jogger's course.



$$d^2 = 2.5^2 + 2^2 - 2(2.5)(2)(\cos 60)$$

$$d^2 = 5.25$$

$$d = 2.3 \text{ miles}$$