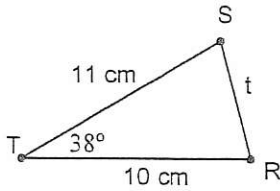


Law of Cosines Practice #1

Key

Solve each triangle given below. Round all angles to the nearest degree. Round all sides to the nearest tenth.

1)



$$t^2 = 11^2 + 10^2 - 2(11)(10)\cos 38$$

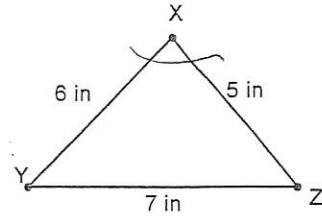
$$t = 6.9$$

$$\angle R = 79^\circ$$

$$\angle S = 63^\circ$$

$$\frac{\sin S}{10} = \frac{\sin 38}{6.9}$$

2)



$$7^2 = 6^2 + 5^2 - 2(6)(5)\cos X$$

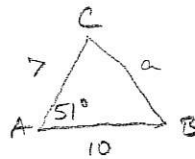
$$X = 78^\circ$$

$$Z = 57^\circ$$

$$Y = 45^\circ$$

$$\frac{\sin Z}{6} = \frac{\sin 78}{7}$$

3) In  $\triangle ABC$ ,  $A = 51^\circ$ ,  $b = 7$ ,  $c = 10$



$$a^2 = 7^2 + 10^2 - 2(7)(10)\cos 51$$

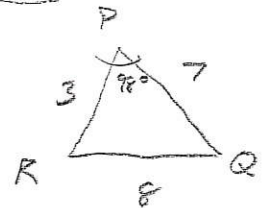
$$a = 7.8$$

$$\frac{\sin 51}{7.8} = \frac{\sin B}{7}$$

$$\angle B = 44^\circ$$

$$\angle C = 85^\circ$$

4) In  $\triangle RPQ$ ,  $r = 7$ ,  $p = 8$ ,  $q = 3$



$$8^2 = 7^2 + 3^2 - 2(7)(3)\cos P$$

$$\angle P = 98^\circ$$

$$\frac{\sin 98}{8} = \frac{\sin R}{7}$$

$$\angle R = 60^\circ$$

$$\angle Q = 22^\circ$$

5) Find the area of the quadrilateral.

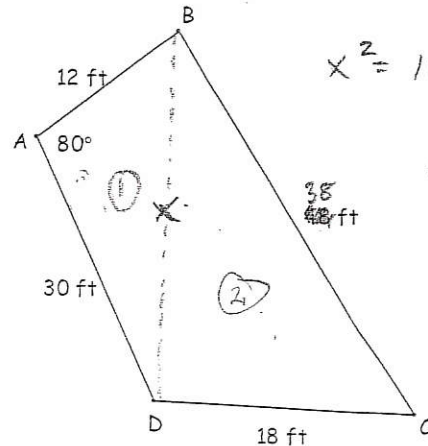
$$A = \frac{1}{2}(12)(30)\sin 80 = 177.27 \text{ ft}^2$$

$$S = 43.155$$

$$A = \sqrt{43.155(5.155)(28.845)(25.155)}$$

$$= 1068.11 \text{ ft}^2$$

$$A = 445.38 \text{ ft}^2 \text{ Total}$$

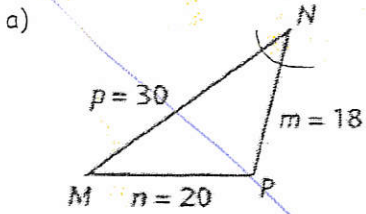


$$x^2 = 12^2 + 30^2 - 2(12)(30)\cos 80$$

$$x = 30.31$$

6) Find each indicated measure.

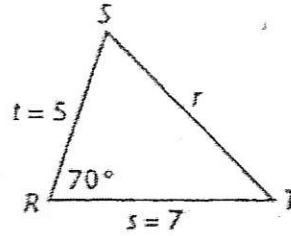
\* Emphasize when only solving for 2 side, they don't have to start w/ biggest side



$$20^2 = 30^2 + 18^2 - 2(30)(18)\cos N$$

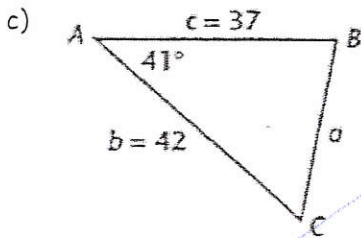
$$\angle N = 40^\circ$$

$m\angle N = 40^\circ$



$$r^2 = 5^2 + 7^2 - 2(5)(7)\cos 70$$

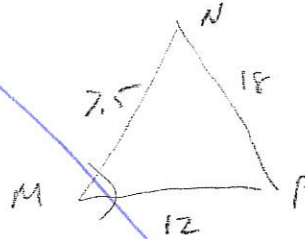
$r = 7.1$



$$a^2 = 37^2 + 42^2 - 2(37)(42)\cos 41$$

$a = 28.1$

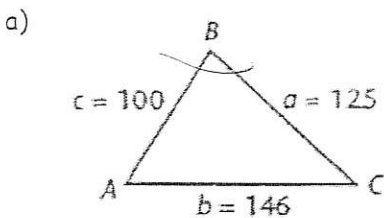
d)  $\triangle MNP$  :  $m = 18, n = 12, p = 7.5$



$$18^2 = 7.5^2 + 12^2 - 2(7.5)(12)\cos M$$

$m\angle M = 134^\circ$

7) Solve each triangle. Give lengths to the nearest tenth and angle measures to the nearest degree.



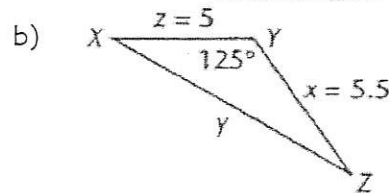
$$146^2 = 100^2 + 125^2 - 2(100)(125)\cos B$$

$\angle B = 80^\circ$

$$\frac{\sin 80}{146} = \frac{\sin A}{125} \quad \text{OR} \quad \frac{\sin 80}{146} = \frac{\sin C}{100}$$

$\angle A = 57^\circ$

$\angle C = 43^\circ$



$$y^2 = 5^2 + 5.5^2 - 2(5)(5.5)\cos 125$$

$y = 9.3$

$\angle X = 29^\circ$   
 $\angle Z = 26^\circ$