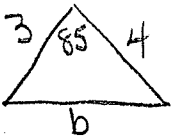


Find the part indicated. Give lengths to nearest hundredth and angle measure to nearest degree.

SAS 1. $a=4, c=3, \angle B=85^\circ, b=4.79$

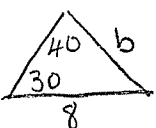


$$b^2 = 3^2 + 4^2 - 2(3)(4)\cos 85$$

$$b^2 = 22.91$$

$$b \approx 4.79$$

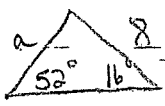
SAA 2. $a=8, \angle A=40^\circ, \angle B=30^\circ, b=6.22$



$$\frac{\sin 40^\circ}{8} = \frac{\sin 30^\circ}{b}$$

$$b = 6.22$$

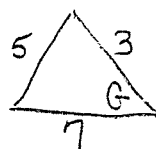
3. $c=8, \angle A=16^\circ, \angle C=52^\circ, a=2.8$



$$\frac{\sin 52^\circ}{8} = \frac{\sin 16^\circ}{a}$$

$$a = 2.8$$

4. $g=5, h=3, i=7, \angle G=38^\circ$



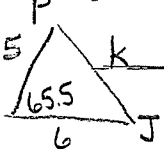
$$5^2 = 7^2 + 3^2 - 2(7)(3)\cos G$$

$$-33 = -42\cos G$$

$$.7857 = \cos G$$

$$38.2 = G$$

5. $j=5, p=6, \angle K=65.5^\circ, k=6.01$

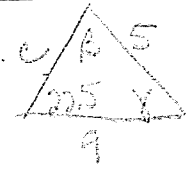


$$k^2 = 5^2 + 6^2 - 2(5)(6)\cos 65.5$$

$$k^2 = 36.12$$

$$k = 6.01$$

6. $a=5, b=9, \angle A=22.3^\circ, \angle B=43.08^\circ$

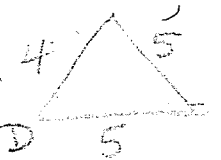


$$\frac{\sin 22.3^\circ}{5} = \frac{\sin B}{9}$$

$$.6888 = \sin B$$

$$43.5 = B$$

7. $d=5, e=4, f=5, \angle D=66.4^\circ$




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

$$-16 = -40\cos D$$

$$.4 = \cos D$$

$$66.4 = D$$

8. $a=12, \angle B=42.1^\circ, \angle C=34.6^\circ, b=8.27$

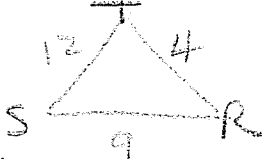


$$\angle A = 103.3$$

$$\frac{\sin 103.3^\circ}{12} = \frac{\sin 42.1^\circ}{b}$$

$$8.27 = b$$

9. In $\triangle RST$, $r=12, s=4$, and $t=9$. Find both the smallest and largest angles.



$$4^2 = 12^2 + 9^2 - 2(12)(9)\cos S$$

$$-209 = -216\cos S$$

$$.9676 = \cos S$$

$$14.6 = S$$

$$\angle S = 14.6 \quad \angle R = 130.8$$

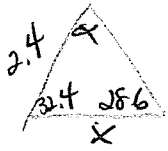
$$12^2 = 4^2 + 9^2 - 2(4)(9)\cos R$$

$$47 = -72\cos R$$

$$-.6528 = \cos R$$

$$130.8^\circ = R$$

10. The cross-section of a mountain approximates a triangle. The west side of the mountain is 2.4 km long from the base to the peak and has a slope of 32.4° with the horizontal. The east side has a slope of 28.6° with the horizontal. What will be the length of a tunnel that is to be drilled through the base from the west side to the east side?

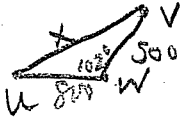


$$\alpha = 119^\circ$$

$$\frac{\sin 28.6}{2.4} = \frac{\sin 119}{x}$$

$$x = 4.39 \text{ km}$$

11. A surveyor sets out stakes at the extreme ends, U and V , of a property line. A point W is located such that $UW = 800$ m, $VW = 500$ m, and $\angle UWV = 102^\circ$. What is the distance from U to V ?



$$x^2 = 800^2 + 500^2 - 2(800)(500)\cos 102$$

$$x = 1056329.353$$

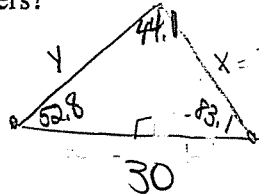
$$x = 1027.78 \text{ m}$$

12. A weather satellite malfunctioned and returned to Earth by parachute. Two observers, 30 km apart, recorded the landing site as being 52.8° and 83.1° , respectively, from the line segment joining their two positions. How far did the satellite land from each of the observers?

Looking down at problem

$$\frac{\sin 44.1}{30} = \frac{\sin 52.8}{x}$$

$$x = 34.34$$

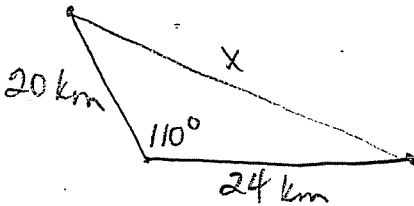


$$\frac{\sin 44.1}{30} = \frac{\sin 83.1}{y}$$

$$y = 42.79$$

$$y = 42.8 \quad x = 34.3$$

13. Two snowmobilers start from the same point and drive at 10 km/h and 12 km/h, respectively, diverging at an angle of 110° . Two hours after leaving, they find that their radio transmissions are barely audible. How far apart are they at that time?



$$x^2 = 20^2 + 24^2 - 2(20)(24)\cos 110^\circ$$

$$x^2 = 1304.34$$

$$x = 36.12$$

$$36.12 \text{ km}$$