Assignment #5 Answer key.

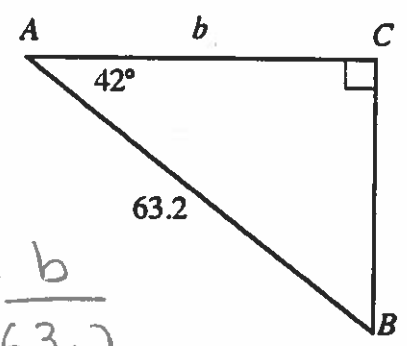
b) Calculate the area of ΔPQR to the nearest hundred square metres.

Complete Assignment Questions #3 - #11

Assignment

1. In each case, determine the length of the indicated side to the nearest tenth.

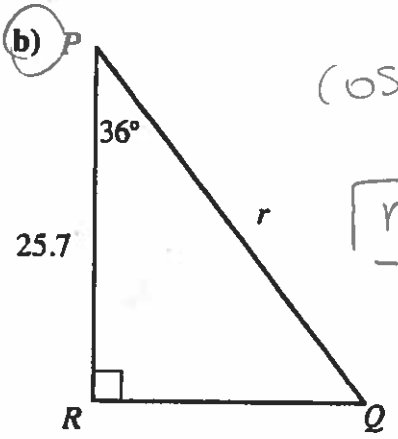
a)



$\cos 42 = \frac{b}{63.2}$

$\boxed{b = 47.0}$

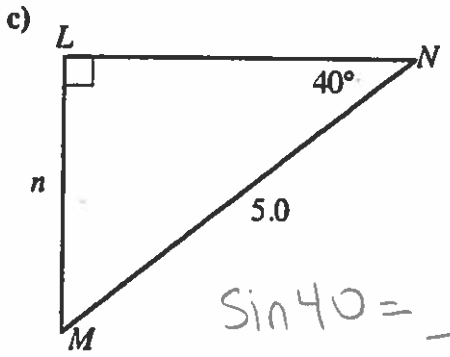
b)



$\cos 36 = \frac{25.7}{r}$

$\boxed{r = 31.8}$

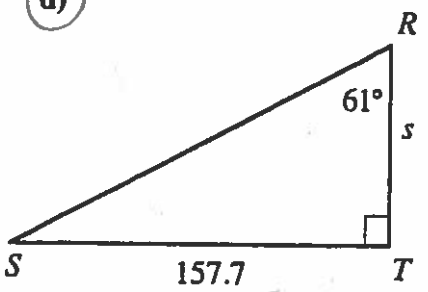
c)



$\sin 40 = \frac{n}{5}$

$\boxed{n = 3.2}$

d)



$\tan 61 = \frac{157.7}{s}$

$\boxed{s = 87.4}$

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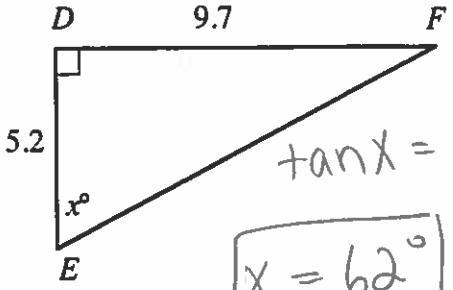
2. In each case, determine the measure of the indicated angle to the nearest degree.

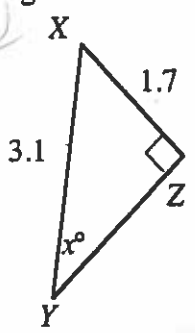
a)



$\tan x = \frac{9.7}{5.2}$

$\boxed{x = 62°}$

b)

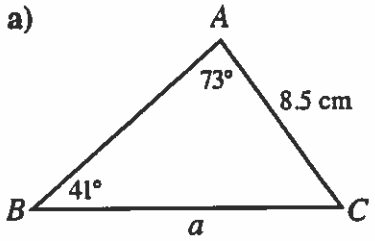


$\sin x = \frac{1.7}{3.1}$

$\boxed{x = 33°}$

3. In each case, find the length of the indicated side to the nearest tenth.

a)

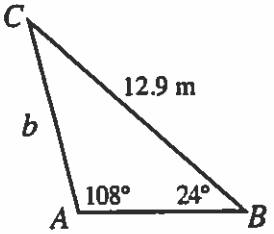


$\frac{a}{\sin 73} = \frac{8.5}{\sin 41}$

$a = \frac{8.5 \sin 73}{\sin 41}$

$\boxed{a = 12.4\text{cm}}$

b)

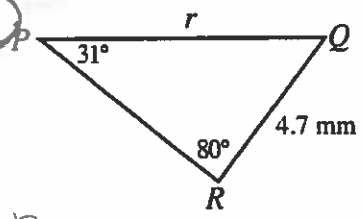


$\frac{b}{\sin 24} = \frac{12.9}{\sin 108}$

$b = \frac{12.9 \sin 24}{\sin 108}$

$\boxed{b = 5.5\text{m}}$

c)



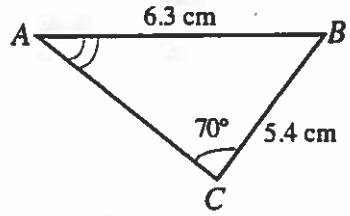
$\frac{r}{\sin 80} = \frac{4.7}{\sin 31}$

$r = \frac{4.7 \sin 80}{\sin 31}$

$\boxed{r = 9.0\text{ mm}}$

4. In each case, find the measure of the indicated angle to the nearest degree.

a)



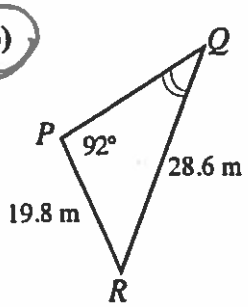
$\frac{\sin A}{5.4} = \frac{\sin 70}{6.3}$

$\sin A = \frac{5.4 \sin 70}{6.3}$

$\angle A = \sin^{-1}(0.805)$

$\boxed{\angle A = 54°}$

b)



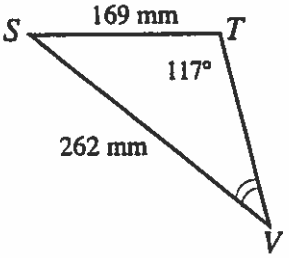
$\frac{\sin Q}{19.8} = \frac{\sin 92}{28.6}$

$\sin Q = \frac{19.8 \sin 92}{28.6}$

$Q = \sin^{-1}(0.69188)$

$\boxed{\angle Q = 44°}$

c)



$\frac{\sin V}{169} = \frac{\sin 117}{262}$

$\sin V = \frac{169 \sin 117}{262}$

$V = \sin^{-1}(0.5747)$

$\boxed{\angle V = 35°}$

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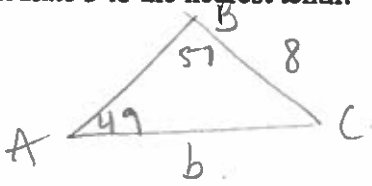
5. In ΔABC, angle $A = 49°$, angle $B = 57°$ and $a = 8$. Calculate b to the nearest tenth.

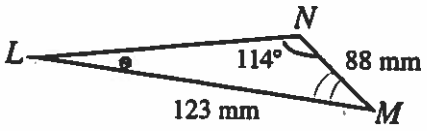


$$\frac{b}{\sin 57} = \frac{8}{\sin 49}$$

$$b = \frac{8 \sin 57}{\sin 49}$$

$$\boxed{b = 8.9}$$

6. In ΔLMN, angle $LNM = 114°$, $LM = 123$ mm and $MN = 88$ mm.
Calculate $\angle LMN$, to the nearest degree.



① Solve $\angle L$ to solve $\angle M$

$$\frac{\sin L}{88} = \frac{\sin 114}{123}$$

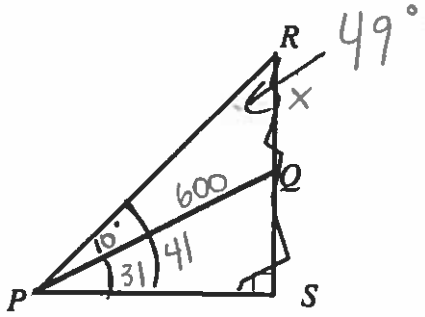
$$\sin L = \frac{88 \sin 114}{123}$$

$$L = \sin^{-1}(0.65359)$$

$$\angle L = 40.81$$

$$180 - 114 - 40.81 = \boxed{25°}$$

7. P and Q are two bases for a mountain climb. PQ is 600 m and QR is a vertical stretch of a rock face. The angle of elevation of Q from P is 31°, and the angle of elevation of R from P is 41°.



a) Mark these measurements on the diagram and state the measure of angle PRQ. 49°

b) Use the sine law in ΔPQR to calculate the height of the vertical climb, QR, to the nearest metre.

$$\angle R = 180 - 90 - 41$$
$$= 49°$$

$$\frac{x}{\sin 10} = \frac{600}{\sin 49}$$

$$x = \frac{600 \sin 10}{\sin 49}$$

$$\boxed{x = 138 \text{ m}}$$

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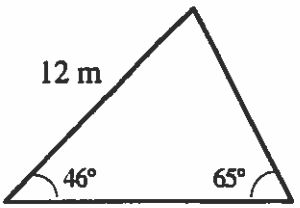
8. Three students are trying to determine the area of the triangle in the diagram. Each student is given a different formula with which to determine the area. The area of the triangle is 53.3 m^2.



Show how each student arrived at this answer.

Student #1: Use the formula $A = \frac{1}{2}bh$, where b is the length of the base and h is the vertical height.

Student #2: Use Heron's formula $A = \sqrt{s(s-a)(s-b)(s-c)}$, where a, b and c are the lengths of the three sides and s is the semi-perimeter of the triangle.

Student #3: Use the formula $A = \frac{1}{2}ab \sin C$, where a and b are the lengths of two sides and angle C is the contained angle between the sides a and b.

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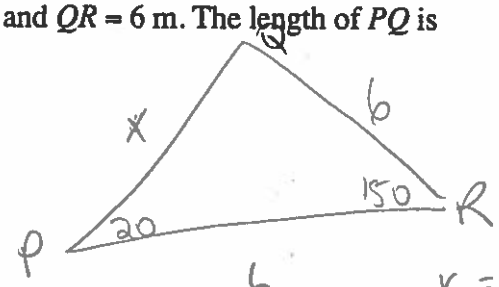
Multiple Choice

9. In triangle PQR, angle $P = 20°$, angle $R = 150°$ and $QR = 6$ m. The length of PQ is

A. 4.1 m
B. 8.8 m
C. 15.2 m
D. 17.3 m



$\frac{r}{\sin 150} = \frac{6}{\sin 20}$ $\quad r = \frac{6 \sin 150}{\sin 20}$

10. In ΔABC, $\angle A = 30°$, $BC = 10$ units and $AC = 15$ units. If $\angle B$ is acute-angled, then $\angle C$ is

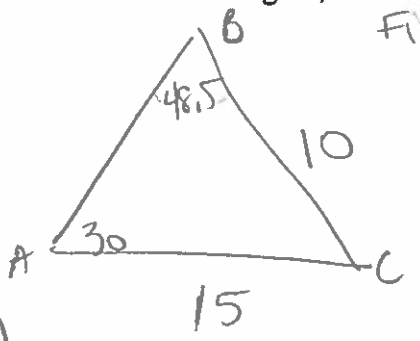
A. 19.4°
B. 48.6°
C. 101.4°
D. 130.6°

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

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

$\sin B = 0.75$

$B = \sin^{-1}(0.75)$

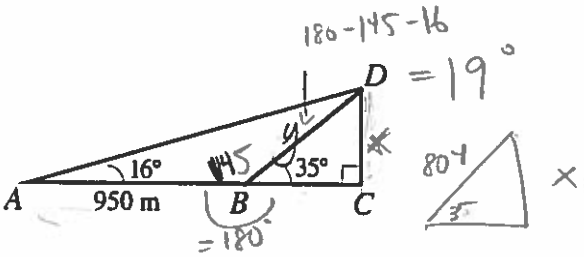


Find $\angle B$ + then $\angle C$.

$180 - 30 - 48.5$
$= 101.4$

Numerical Response

11. From a point A, level with the foot of a hill, the angle of elevation of the top of the hill is 16°. From a point B, 950 metres nearer the foot of the hill, the angle of elevation of the top is 35°.
The height of the hill, DC, to the nearest metre, is ____ .



(Record your answer in the numerical response box from left to right.)

4	6	1	

$\frac{y}{\sin 16} = \frac{950}{\sin 19}$

$y = 804.3$

$\sin 35 = \frac{x}{804.3}$

$x = 461$

Answer Key

1. a) 47.0 b) 31.8 c) 3.2 d) 87.4
2. a) 62° b) 33°
3. a) 12.4 cm b) 5.5 m c) 9.0 mm
4. a) 54° b) 44° c) 35°
5. 8.9
6. 25°
7. a) 49° b) 138 m
9. B
10. C
11. 4 6 1

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