

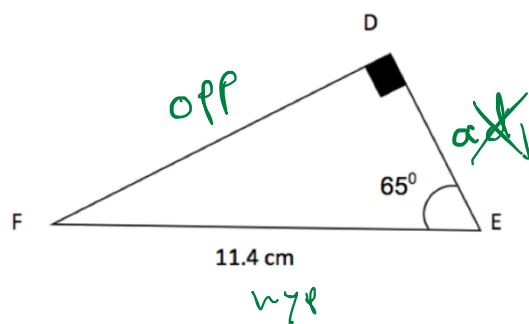
Name: \_\_\_\_\_

Date: \_\_\_\_\_

Final Exam Review – 14

Trigonometry Metric Relations

1. Consider the right triangle DEF below.



$$\frac{\text{opp}}{\text{hyp}} = \sin \theta$$

$$\frac{DE}{11.4} = \sin 65^\circ$$

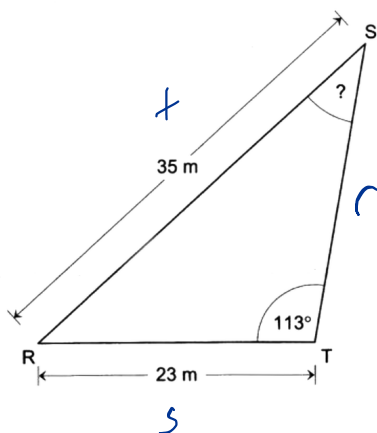
$$DE = 10.33$$

To the nearest hundredth of a unit, what is the length of line segment DF?

A) 4.82 cm                      C) 12.58 cm

B) 10.33 cm                      D) 24.45 cm

2. Consider triangle RST represented below.



$$\frac{r}{\sin R} = \frac{s}{\sin T} = \frac{t}{\sin \theta}$$

$$\frac{35}{\sin R} = \frac{23}{\sin 113^\circ}$$

$$\sin R = \frac{23 \sin 113^\circ}{35}$$

$$\sin R = 0.60$$

$$R = 37^\circ$$

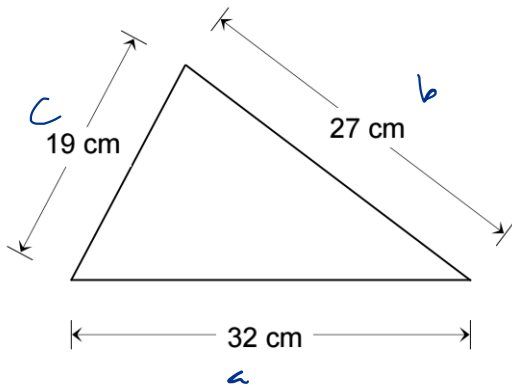
To the nearest degree, what is the measure of angle RST?

A) 37°                      C) 49°

B) 41°                      D) 78°

3. Consider the triangle shown below.

To the nearest  $\text{cm}^2$ , what is the area of this triangle?



$$s = \frac{a+b+c}{2} = \frac{32+27+19}{2} = 39$$

$$\sqrt{s(s-a)(s-b)(s-c)}$$

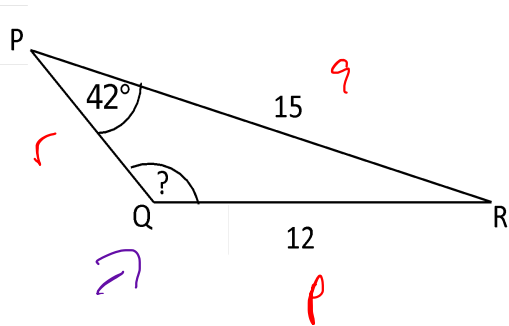
$$\sqrt{39(39-32)(39-27)(39-19)}$$

$$\sqrt{39(7)(12)(20)}$$

$$\sqrt{65520}$$

$$256$$

4. To the nearest integer, what is the measure of angle PQR?



obtuse

$$180 - 56.7 = 123.3$$

123

$$\frac{P}{\sin P} = \frac{9}{\sin Q} = \frac{r}{\sin R}$$

$$\frac{12}{\sin 42} = \frac{15}{\sin Q} = \frac{r}{\sin R}$$

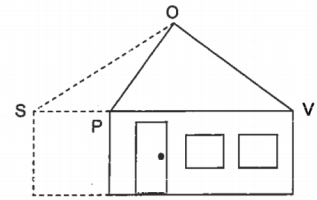
$$\frac{15 \sin 42}{12} = \sin Q$$

$$0.836... = \sin Q$$

$$56.76 = Q$$

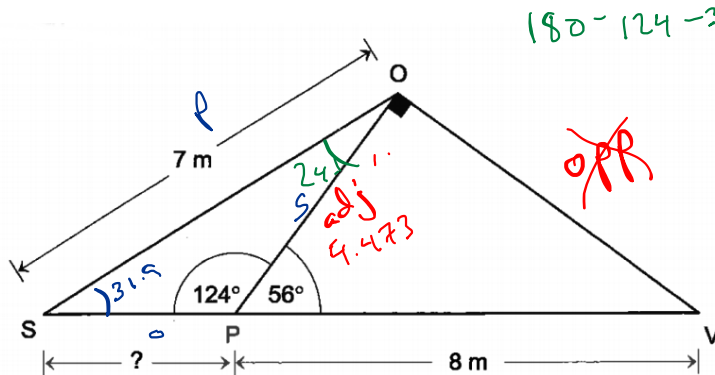
## 5. Valerie's House

Valerie is adding an extension onto her house to make it bigger.



In the figure below, triangle SOV represents the front view of the roof after the extension is added.

To the nearest tenth of a meter, what is the width of the extension?



$$\cancel{\frac{SO}{\sin A}} = \frac{A}{\sin A} \quad \cancel{\frac{PV}{\sin A}}$$

$$\frac{\cos 56}{1} = \frac{x}{8}$$

$$\frac{8(\cos 56)}{1} = x$$

$$4.473$$

$$\frac{SO}{\sin O} = \frac{PV}{\sin P} = \frac{S}{\sin S}$$

$$\cancel{\frac{x}{\sin O}} = \frac{7}{\sin 24} = \frac{4.473}{\sin S}$$

$$\frac{\sin 24 (4.473)}{7} = \sin S$$

$$\sin^{-1} 0.529 \dots = \sin S$$

$$31.99 = S$$

$$\frac{SO}{\sin 24.1} = \frac{7}{\sin 24} = \frac{\cancel{4.473}}{\sin 31.9}$$

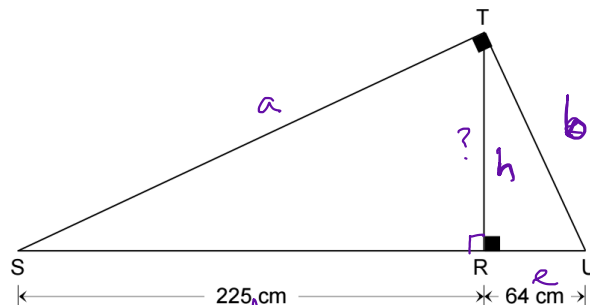
$$\frac{7(\sin 24.1)}{\sin 124} = 3.4 \text{ m}$$

6. Altitude TR was drawn in right triangle STU shown below

What is the length of altitude TR?

$$\begin{aligned} a & \\ b & \\ c &= 289 \\ d &= 225 \\ e &= 64 \\ h &= 120 \end{aligned}$$

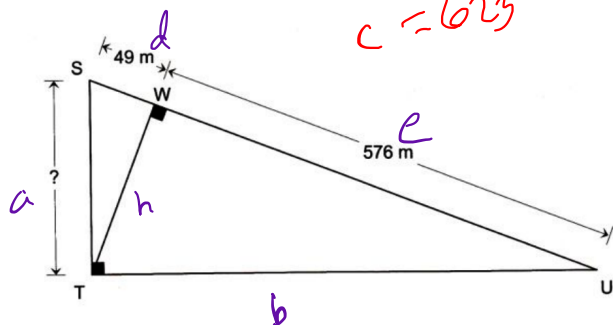
$$\begin{aligned} c &= d + e \\ &= 225 + 64 \\ c &= 289 \\ h^2 &= d \cdot e \\ h^2 &= 225 \cdot 64 \\ h^2 &= 14400 \\ h &= 120 \end{aligned}$$



$$\begin{aligned} a^2 &= c \cdot d \\ b^2 &= e \cdot c \\ h^2 &= d \cdot e \\ a \cdot b &= c \cdot h \\ c &= d + e \\ a^2 + b^2 &= c^2 \\ a^2 &= h^2 + d^2 \\ b^2 &= h^2 + e^2 \end{aligned}$$

7. Altitude TW was drawn in right triangle STU represented below.

What is the length of line segment ST?



$$c = 625$$

$$\begin{aligned} c &= d + e \\ c &= 49 + 576 \\ c &= 625 \end{aligned}$$

$$\begin{aligned} a^2 &= c \cdot d \\ b^2 &= e \cdot c \\ h^2 &= d \cdot e \\ a \cdot b &= c \cdot h \\ c &= d + e \\ a^2 + b^2 &= c^2 \\ a^2 &= h^2 + d^2 \\ b^2 &= h^2 + e^2 \end{aligned}$$

$$a = 175$$

$$\begin{aligned} b & \\ c &= 625 \\ d &= 49 \\ e &= 576 \\ h & \end{aligned}$$

$$\begin{aligned} a^2 &= c \cdot d \\ a^2 &= 625 \cdot 49 \\ \sqrt{a^2} &= \sqrt{30625} \\ a &= 175 \end{aligned}$$