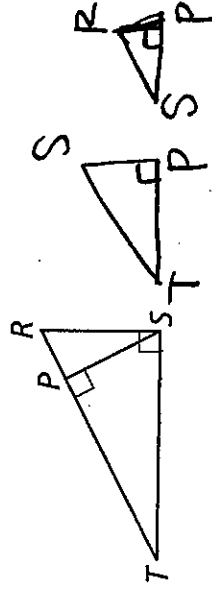


1. Complete the similarity statement comparing the three triangles:



$\triangle SRT \sim \triangle PST \sim \triangle PRS$

2. List the four sets of Pythagorean Triples:

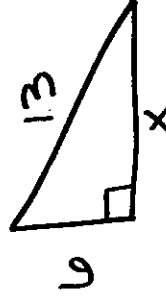
a. 3 - 4 - 5

b. 8 - 15 - 17

c. 5 - 12 - 13

d. 7 - 24 - 25

3. In a right triangle, one leg is a length of 6 and the hypotenuse is a length of 13. Find the length of the remaining leg. Draw a diagram. Give answer in exact form, simplified completely.



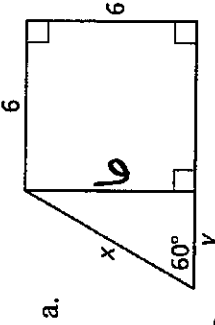
$6^2 + x^2 = 13^2$
 $36 + x^2 = 169$
 $x = \sqrt{133}$

4. The lengths of three segments are 4, 9, and $\sqrt{67}$. Verify that these segments can form a triangle (SHOW REQUIRED WORK!!!) If so, determine whether the triangle is acute, right, or obtuse.

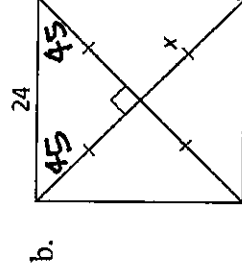
$4 + 9 > 8.2$ ✓
 $9 + 8.2 > 4$ ✓
 $4 + 8.2 > 9$ ✓

$4^2 + (\sqrt{67})^2 > 9^2$
 $16 + 67 > 81$
 $83 > 81 \rightarrow$ **acute $\triangle$**

5. Find the values of x and y in each diagram. Give answers in exact form, simplified completely.



$\text{hyp} = 2SL$
 $x = 4\sqrt{3}$



$\text{hyp} = SL\sqrt{2}$
 $24 = x\sqrt{2}$
 $x = \frac{24}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{24\sqrt{2}}{2} = 12\sqrt{2}$

6. Find the geometric mean of the pair of numbers. Give EXACT answers, simplified completely.

$\frac{3}{x} = \frac{x}{17}$

3 and 17

$x^2 = (3)(17)$

$x = \sqrt{51}$

7. Find the following EXACT ratios, simplified! (hint: you can use your answers from #5 ☺)

a) $\cos(60^\circ) = \frac{1}{2}$

b) $\tan(30^\circ) = \frac{\sqrt{3}}{3}$

c) $\tan(45^\circ) = 1$

8. Find x, y, and z. Give EXACT lengths, simplified completely. (not approximate)



$x = 3$

$y = 3\sqrt{3}$

$z = 6\sqrt{3}$

$\frac{y}{12} = \frac{x}{6}$
 $36 = 12x$
 $3 = x$
 $y^2 = (12+3)(3)$
 $y^2 = (15)(3)$
 $y = \sqrt{45} = 3\sqrt{5}$

9. Find the following. Round to two decimal places.

a) $UV = 11.17$ $UW = 1.94$



$\sin 80 = \frac{11}{x}$
 $x = \frac{11}{\sin 80}$

$0.9848 = \frac{11}{x}$
 $x \approx 11.17$

$\tan 80 = \frac{11}{y}$
 $y = \frac{11}{\tan 80}$

$y \approx 1.94$

$z^2 = (12)(15)$
 $z = \sqrt{180} = 6\sqrt{5}$

b) $m\angle P = 17.72^\circ$

$m\angle R = 72.28^\circ$

$\sin P = \frac{1}{23}$

$m\angle P = \sin^{-1}(\frac{1}{23})$

$m\angle P \approx 17.72$

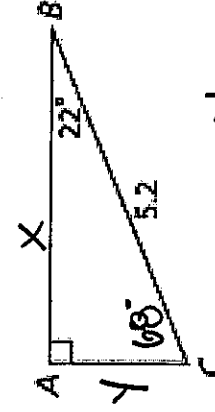
$\triangle$ sum $\neq 180$

10. Solve the triangle. Round lengths and angle measures to two decimal places.

a) $m\angle C = 68^\circ$

$AB = 4.82$

$AC = 1.94$



$$\sin 68 = \frac{x}{5.2}$$

$$x = (5.2)(\sin 68)$$

$$x \approx 4.82$$

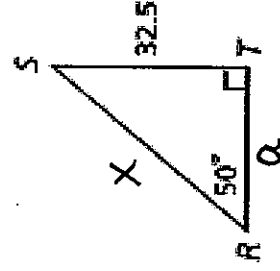
$$\cos 68 = \frac{y}{5.2}$$

$$y = (5.2)(\cos 68) \approx 1.94$$

b) $m\angle S = 40^\circ$

$SR = 42.43$

$RT = 27.27$



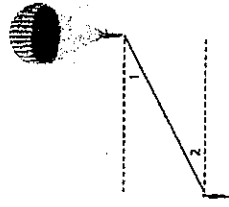
$$\cos 40^\circ = \frac{32.5}{x}$$

$$x = \frac{32.5}{\cos 40} \approx 42.43$$

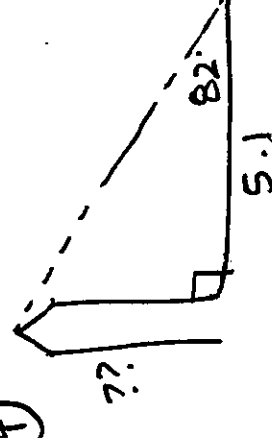
$$\tan 40 = \frac{a}{32.5}$$

$$a = (32.5)(\tan 40) \approx 27.27$$

11. Classify $\angle 1$ as an angle of elevation or depression: depression
from balloon to person



12. When the angle of elevation to the sun is 82° , a monument casts a shadow that is 5.1 feet long. What is the height of the monument to the nearest foot?



$$\tan 82 = \frac{x}{5.1}$$

approx. 36 ft tall

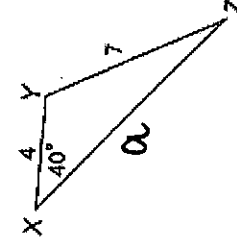
$$x = (5.1)(\tan 82) \approx 36.29$$

13. Solve the triangle. Round lengths and angle measures to two decimal places.

$m\angle Z = 21.55^\circ$

$m\angle Y = 118.45$

$XZ = 9.57$



$$\frac{\sin 40}{7} = \frac{\sin Z}{4}$$

$$\sin Z = 0.367$$

$$m\angle Z = \sin^{-1}(0.367) \approx 21.55$$

$$\frac{\sin 40}{7} = \frac{\sin 118.45}{a}$$

$$a \approx 9.57$$

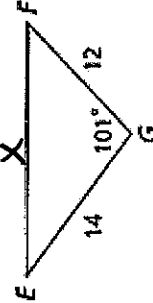
$m\angle Y \approx 118.45$ by
 Δ sum thm

14. Solve the triangle. Round lengths and angle measures to two decimal places.

$m\angle E = 35.88^\circ$

$m\angle F = 43.12$

$EF = 20.10$



$$x^2 = (14)^2 + (12)^2 - 2(14)(12)\cos 101^\circ$$

$$x^2 = 340 - (-64.112)$$

$$\sqrt{x^2} = \sqrt{404.112}$$

$$x \approx 20.10$$

$$\frac{\sin 101}{20.1} = \frac{\sin E}{12}$$

$$\sin E = 0.586$$

$$m\angle E = \sin^{-1}(0.586) \approx 35.88^\circ$$

$m\angle F \approx 43.12$ by
 Δ sum thm