

Name: Key

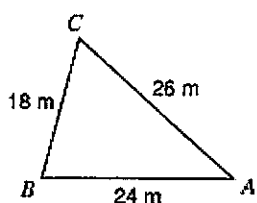
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HW #9-11: Test Review Worksheet

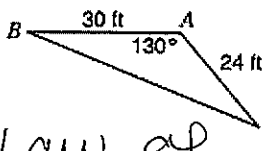
1. Determine whether the Law of Sines or the Law of Cosines should be used to solve the triangle. (don't solve the triangle!)

a.



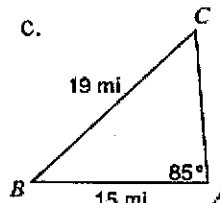
Law of Cosines (SSS)

b.



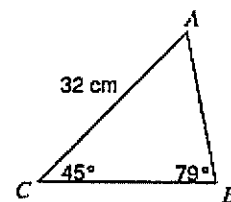
Law of Cosines (SAS)

c.



Law of Sines (SSA)

d.



Law of Sines (AAS)

2. List the four sets of Pythagorean Triples we saw this chapter.

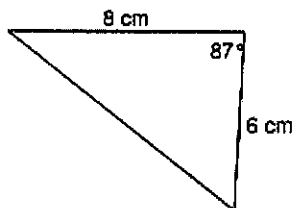
① 3-4-5

③ 8-15-17

② 5-12-13

④ 7-24-25

3. Find the area of the triangle. Round to three decimal places, if necessary.



$$\text{area} = \frac{(8)(6)(\sin 87)}{2}$$

$$\approx 23.967 \text{ cm}^2$$

$$\sin 51 = \frac{9}{y}$$

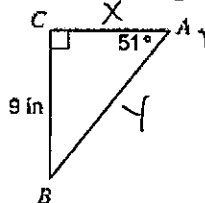
$$\frac{0.7771}{1} = \frac{9}{y}$$

$$0.7771y = 9$$

$$y \approx 11.581$$

$$AB \approx 11.581$$

4. Solve the triangle. Round to three decimal places, if necessary.



$$m\angle B = 39^\circ$$

$$\tan 51 = \frac{9}{x}$$

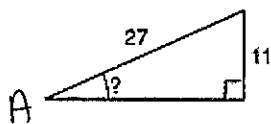
$$\frac{1.2349}{1} = \frac{9}{x}$$

$$1.2349x = 9$$

$$x \approx 7.288$$

$$AC \approx 7.288$$

5. Find the measure of the missing angle. Round to three decimal places, if necessary.

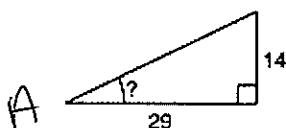


$$\sin A = \frac{11}{27}$$

$$m\angle A = \sin^{-1}\left(\frac{11}{27}\right)$$

$$m\angle A \approx 24.042^\circ$$

6. Find the measure of the missing angle. Round to three decimal places, if necessary.

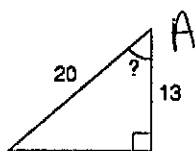


$$\tan A = \frac{14}{29}$$

$$m\angle A \approx \tan^{-1}\left(\frac{14}{29}\right)$$

$$m\angle A \approx 25.769^\circ$$

7. Find the measure of the missing angle. Round to three decimal places, if necessary.

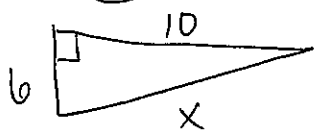


$$\cos A = \frac{13}{20}$$

$$m\angle A = \cos^{-1}\left(\frac{13}{20}\right)$$

$$m\angle A \approx 49.458^\circ$$

8. The legs of a right triangle are 6 ft and 10 ft. Find the length of the hypotenuse (EXACT answers only)



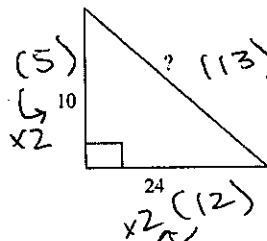
$$6^2 + 10^2 = x^2$$

$$\sqrt{136} = \sqrt{x^2}$$

$$x = \sqrt{4 \cdot 34}$$

$$x = 2\sqrt{34}$$

9. Find the length of the missing side. (HINT: the triangle forms a Pythagorean Triple!)



$$x = 13$$

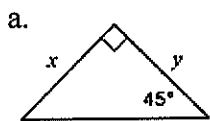
OR

$$10^2 + 24^2 = x^2$$

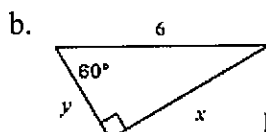
$$\sqrt{676} = \sqrt{x^2}$$

$$x = 26$$

10. Find the values of x and y in each triangle. (EXACT answers only)

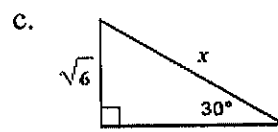


$$y = 4\sqrt{2}$$



$$LL = SL\sqrt{3}$$

$$x = 3\sqrt{3}$$



$$LL = SL\sqrt{3}$$

$$y = (\sqrt{6})(\sqrt{3})$$

$$y = \sqrt{18}$$

$$x = 2\sqrt{6}$$

$$\text{hyp} = \text{leg}\sqrt{2}$$

$$8 = x\sqrt{2}$$

$$x = \frac{8}{\sqrt{2}} \left(\frac{\sqrt{2}}{\sqrt{2}} \right)$$

$$x = \frac{8\sqrt{2}}{2}$$

$$x = 4\sqrt{2}$$

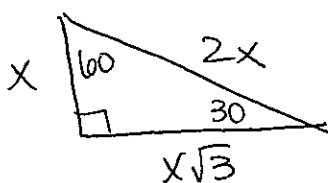
$$\text{hyp} = 2SL$$

$$6 = 2y$$

$$3 = y$$

11. Consider a 30-60-90 right triangle. Find the following (EXACT answers only):

- $\tan(30^\circ) = \frac{\sqrt{3}}{3}$
- $\tan(60^\circ) = \sqrt{3}$
- $\sin(30^\circ) = \frac{1}{2}$
- $\sin(60^\circ) = \frac{\sqrt{3}}{2}$
- $\cos(30^\circ) = \frac{\sqrt{3}}{2}$
- $\cos(60^\circ) = \frac{1}{2}$

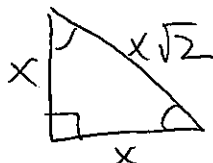


$$\tan(30) = \frac{x}{x\sqrt{3}} = \frac{1}{\sqrt{3}} \left(\frac{\sqrt{3}}{\sqrt{3}} \right)$$

$$= \frac{\sqrt{3}}{3}$$

12. Consider a 45-45-90 right triangle. Find the following (EXACT answers only):

- $\tan(45^\circ) = 1$
- $\sin(45^\circ) = \frac{\sqrt{2}}{2}$
- $\cos(45^\circ) = \frac{\sqrt{2}}{2}$



13. Given are three side lengths of a triangle. Determine whether the triangle is acute, right, or obtuse.

- 9.6, 20.1, 18

$$9.6^2 + 18^2 \stackrel{?}{>} 20.1^2$$

$$416.16 > 404.01$$

acute Δ

- 6, $2\sqrt{55}$, 17

$$6^2 + (2\sqrt{55})^2 \stackrel{?}{>} 17^2$$

$$36 + 4(55) \stackrel{?}{>} 289$$

$$256 < 289$$

obtuse Δ

- 4.8, 28.6, 29

$$4.8^2 + 28.6^2 \stackrel{?}{=} 29^2$$

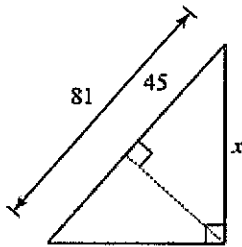
$$841 = 841$$

right Δ

14. Find the geometric mean of 3 and 21 (EXACT answers only)

$$\frac{x}{3} = \frac{21}{x} \rightarrow x^2 = 63 \rightarrow x = \sqrt{63} \Rightarrow x = 3\sqrt{7}$$

15. Find the value of x .

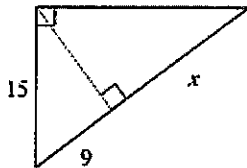


$$x^2 = (45)(81)$$

$$x = \sqrt{9.5 \cdot 81}$$

$$x = 3.9\sqrt{5} \rightarrow \boxed{x = 27\sqrt{5}}$$

16. Find the value of x .

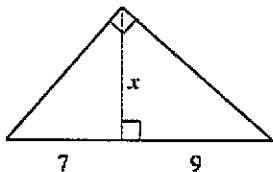


$$15^2 = (9)(9+x)$$

$$225 = 81 + 9x$$

$$144 = 9x \rightarrow \boxed{x = 16}$$

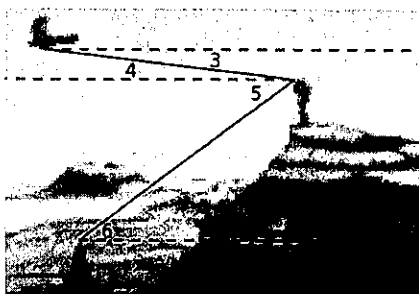
17. Find the value of x .



$$x^2 = (7)(9)$$

$$x = \sqrt{7 \cdot 9} \rightarrow \boxed{x = 3\sqrt{7}}$$

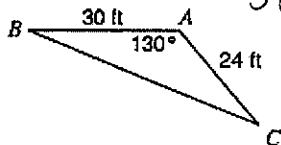
18. In the diagram, determine which angles are angles of elevation and which angles are angles of depression.



$\angle 4$ and $\angle 6$

$\angle 3$ and $\angle 5$

19. Find BC .



SAS - Law of Cosines

$$BC^2 = 30^2 + 24^2 - 2(30)(24)(\cos 130)$$

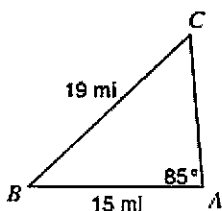
$$BC^2 = 1476 - [(1440)(-0.6428)]$$

$$BC^2 = 1476 + 925.6142$$

$$\sqrt{BC^2} = \sqrt{2401.6142}$$

$$\boxed{BC \approx 49.01 \text{ ft}}$$

20. Find $m\angle C$



SSA - Law of Sines

$$\frac{15}{\sin C} = \frac{19}{\sin 85}$$

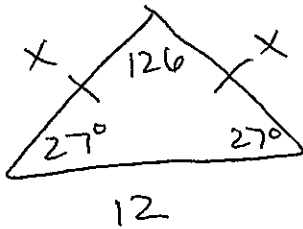
$$\frac{15}{\sin C} = \frac{19}{0.9962}$$

$$\rightarrow 19(\sin C) = 14.9429$$

$$\sin C = 0.7865$$

$$m\angle C = \sin^{-1}(0.7865)$$

21. Find the perimeter of an isosceles triangle with a base angle measure of 27° and a base length of 12 ft.



$$\frac{12}{\sin 126} = \frac{x}{\sin 27}$$

$$\frac{12}{0.8090} = \frac{x}{0.4540}$$

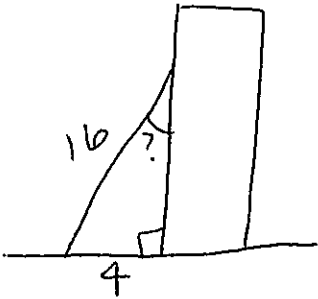
$$0.8090x = 5.4479$$

$$x \approx 6.73$$

$$\text{per.} = 12 + 6.73 + 6.73$$

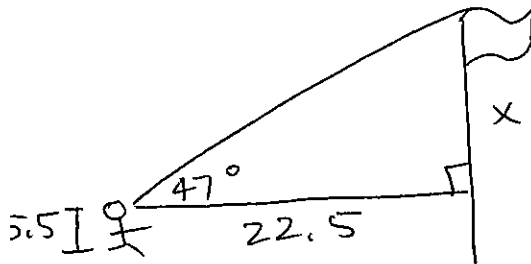
$$\text{per.} \approx 25.46 \text{ ft}$$

22. A 16-foot ladder leans against a building. The base of the ladder is 4 feet away from the ground. Find the measure of the angle that the ladder makes with the building. Round to two decimal places.



$$\sin^{-1}\left(\frac{4}{16}\right) \approx 14.48^\circ$$

23. Johnny is calculating the height of the flagpole at his school. He walked 15 steps from the flagpole and each stride is 1.5 feet wide. The angle of elevation to the top of the flagpole is 47° . Johnny's eyes are 5.5 feet from the ground. What is the approximate height of the flagpole? Round to two decimal places.



$$\tan(47) = \frac{x}{22.5}$$

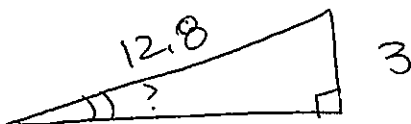
$$\frac{1.0724}{1} = \frac{x}{22.5}$$

$$x \approx 24.1283$$

add eye height!
+ 5.5 ft

flagpole is
 ≈ 29.63 ft
tall

24. A wheelchair ramp is 12.8 feet long. The top of the ramp is 3 feet higher than the ground. What is the angle of elevation? Round to two decimal places.



$$\sin^{-1}\left(\frac{3}{12.8}\right) \approx 13.55^\circ$$