

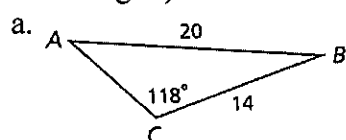
Name: key

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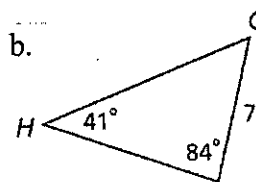
Period:

OPTIONAL Practice Test

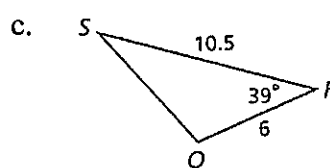
1. Determine whether the Law of Sines or the Law of Cosines should be used to solve the triangle. (don't solve the triangle!)



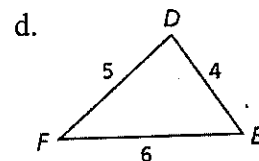
SSA - Law of Sines



AAS - Law of Sines



SAS - Law of Cosines



SSS - Law of Cosines

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

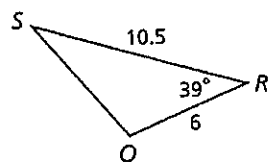
① 3-4-5

③ 8-15-17

② 5-12-13

④ 7-24-25

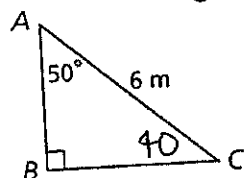
3. Find the area of the triangle. Round to three decimal places, if necessary.



$$\text{area} = \frac{1}{2} (10.5)(6)(\sin 39^\circ)$$

$$\approx 19.824 \text{ units}^2$$

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



$$m\angle C = 40^\circ$$

$$\sin 40 = \frac{AB}{6}$$

$$AB = (0.6428)(6)$$

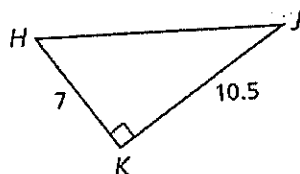
$$AB \approx 3.857$$

$$\cos 40 = \frac{BC}{6}$$

$$BC = (0.7660)(6)$$

$$BC \approx 4.596$$

5. Find $m\angle J$. Round to three decimal places, if necessary.

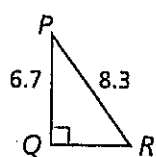


$$\tan J = \frac{7}{10.5}$$

$$m\angle J = \tan^{-1}\left(\frac{7}{10.5}\right)$$

$$m\angle J \approx 33.690^\circ$$

6. Find $m\angle R$. Round to three decimal places, if necessary.

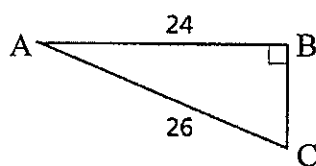


$$\sin R = \frac{6.7}{8.3}$$

$$m\angle R = \sin^{-1}\left(\frac{6.7}{8.3}\right)$$

$$m\angle R \approx 53.826^\circ$$

7. Find $m\angle A$. Round to three decimal places, if necessary.

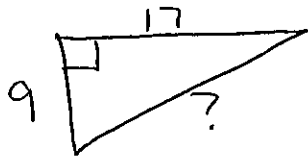


$$\cos A = \frac{24}{26}$$

$$m\angle A = \cos^{-1}\left(\frac{24}{26}\right)$$

$$m\angle A \approx 22.620^\circ$$

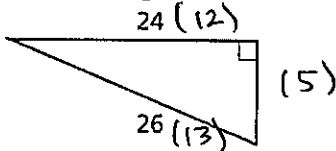
8. The legs of a right triangle are 9 ft and 17 ft. Find the length of the hypotenuse (EXACT answers only)



$$9^2 + 17^2 = x^2$$

$$370 = x^2 \rightarrow \boxed{x = \sqrt{370}}$$

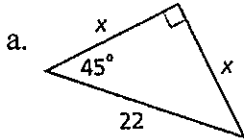
9. Find the length of the missing side. (HINT: the triangle forms a Pythagorean Triple!)



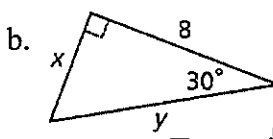
*scale factor = 2 in 5-12-13

side is $\boxed{10}$

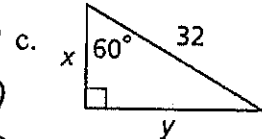
10. Find the values of x and y in each triangle. (EXACT answers only)



hyp = leg $\sqrt{2}$
 $22 = x\sqrt{2}$
 $x = \frac{22}{\sqrt{2}} \left(\frac{\sqrt{2}}{\sqrt{2}} \right) \rightarrow \boxed{x = 11\sqrt{2}}$



LL = SL $\sqrt{3}$
 $8 = x\sqrt{3}$
 $x = \frac{8}{\sqrt{3}} \left(\frac{\sqrt{3}}{\sqrt{3}} \right) \rightarrow \boxed{x = \frac{8\sqrt{3}}{3}}$
 $y = \frac{16\sqrt{3}}{3}$



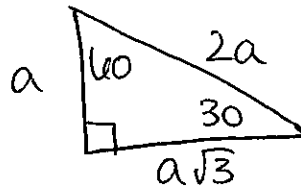
hyp = 2SL
 $32 = 2x$
 $x = 16$
 $y = 16\sqrt{3}$

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

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

b. $\sin(30^\circ) = \frac{1}{2}$

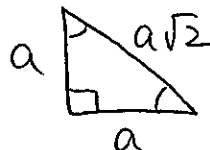
c. $\cos(30^\circ) = \frac{\sqrt{3}}{2}$



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

a. $\tan(45^\circ) = 1$

b. $\cos(45^\circ) = \frac{\sqrt{2}}{2}$



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

a. 18, 20, 27
 $18^2 + 20^2 \boxed{?} 27^2$
 $724 < 729$
 $\boxed{\text{obtuse } \Delta}$

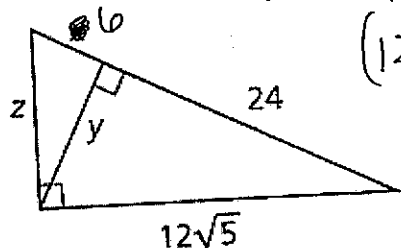
b. 2, 3.7, 4.1
 $2^2 + 3.7^2 \boxed{?} 4.1^2$
 $17.69 > 16.81$
 $\boxed{\text{acute } \Delta}$

c. 8, $2\sqrt{33}$, 14
 $8^2 + (2\sqrt{33})^2 \boxed{?} 14^2$
 $64 + (4)(33) \boxed{?} 196$
 $196 = 196$
 $\boxed{\text{right } \Delta}$

14. Find the geometric mean of 5 and 12 (EXACT answers only)

$\frac{5}{x} = \frac{x}{12} \rightarrow \sqrt{x^2} = \sqrt{60} \rightarrow x = \sqrt{4 \cdot 15}$
 $\boxed{x = 2\sqrt{15}}$

15. Find the values of x, y, and z. (exact answers only)



$$(12\sqrt{5})^2 = (24+x)(24)$$

$$720 = (24+x)(24)$$

$$30 = 24+x$$

$$\boxed{x=6}$$

$$y^2 = (6)(24)$$

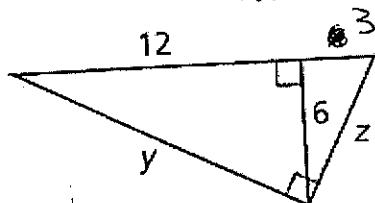
$$y = \sqrt{6 \cdot 6 \cdot 4}$$

$$y = 6 \cdot 2$$

$$\boxed{y=12}$$

*see last page for z

16. Find the values of x, y, and z. (exact answers only)



$$6^2 = (12)(x)$$

$$36 = 12x$$

$$\boxed{3=x}$$

$$y^2 = (12+3)(12)$$

$$y = \sqrt{5 \cdot 3 \cdot 4 \cdot 3}$$

$$y = 2 \cdot 3 \cdot \sqrt{5}$$

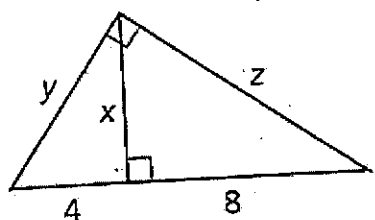
$$\boxed{y=6\sqrt{5}}$$

$$z^2 = (12+3)(3)$$

$$z = \sqrt{5 \cdot 3 \cdot 3}$$

$$\boxed{z=3\sqrt{5}}$$

17. Find the values of x, y, and z. (exact answers only)



$$x^2 = (4)(8)$$

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

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

$$y^2 = (4+8)(4)$$

$$y = \sqrt{4 \cdot 3 \cdot 4}$$

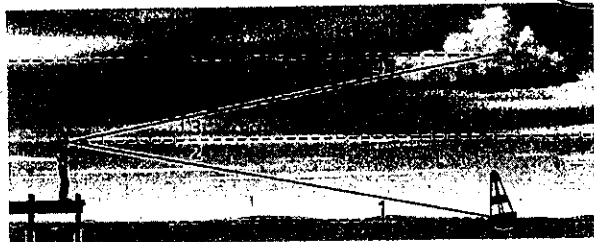
$$\boxed{y=4\sqrt{3}}$$

$$z^2 = (8+4)(8)$$

$$z = \sqrt{4 \cdot 3 \cdot 4 \cdot 2}$$

$$\boxed{z=4\sqrt{6}}$$

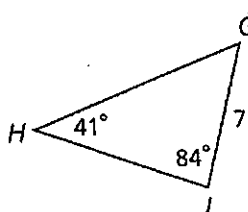
18. In the diagram, determine which angles are angles of elevation and which angles are angles of depression.



$\angle 3, \angle 1$

$\angle 4, \angle 2$

19. Find HJ. Round to two decimal places.



$$m\angle G = 55^\circ$$

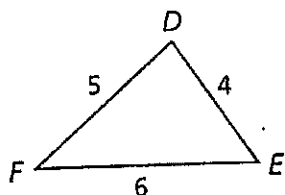
$$\frac{HJ}{\sin 55} = \frac{7}{\sin 41}$$

$$\frac{HJ}{0.8192} = \frac{7}{0.6561}$$

$$(0.6561)(HJ) = 5.7341$$

$$\boxed{HJ \approx 8.74}$$

20. Find $m\angle E$. Round to two decimal places.



$$5^2 = 4^2 + 6^2 - 2(4)(6)(\cos E)$$

$$25 = 52 - 48 \cos E$$

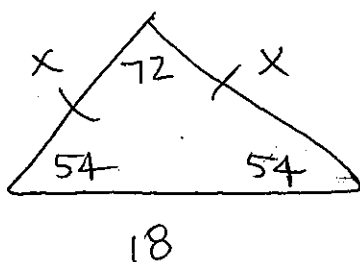
$$-27 = -48 \cos E$$

$$\cos E = 0.5625$$

$$m\angle E = \cos^{-1}(0.5625)$$

$$\boxed{m\angle E \approx 55.77^\circ}$$

21. Find the perimeter of an isosceles triangle with a base angle measure of 54° and a base length of 18 ft. Round to two decimal places.



$$\frac{x}{\sin 54} = \frac{18}{\sin 72}$$

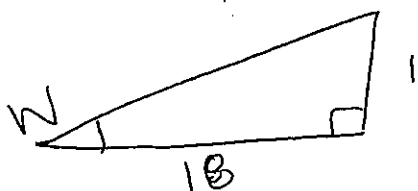
$$x(0.9511) = 14.5623$$

$$x \approx 15.31$$

$$\text{perimeter} \approx 15.31 + 15.31 + 18$$

$$\boxed{\text{per.} \approx 48.62 \text{ ft}}$$

22. The wheelchair ramp at the entrance of the Mission Bay Library has a slope of $\frac{1}{18}$. What angle does the ramp make with the sidewalk? Round to two decimal places.

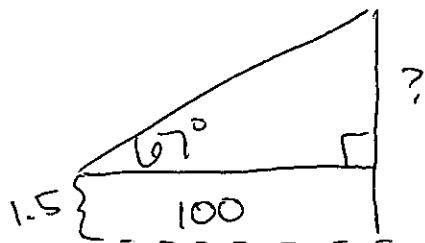


$$\tan W = \frac{1}{18}$$

$$m\angle W = \tan^{-1}\left(\frac{1}{18}\right)$$

$$\boxed{\approx 3.18^\circ}$$

23. To measure the height of a rock formation, a surveyor places her transit 100m from its base and focuses the transit on the top of the formation. The angle of elevation is 67° . The transit is 1.5, above the ground. What is the height of the rock formation? Round to two decimal places.



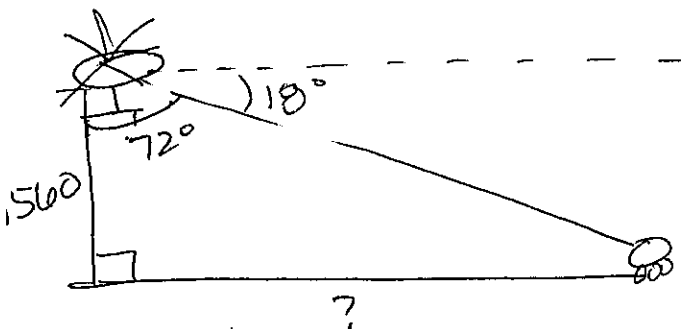
$$\tan 67 = \frac{x}{100}$$

$$x \approx 235.59 \text{ m}$$

*add height of transit!

rock formation is $\approx 237.09 \text{ m}$ tall

24. A pilot of a traffic helicopter sights an accident at an angle of depression of 18° . The helicopter's altitude is 1560 ft. What is the horizontal distance from the helicopter to the accident? Round to two decimal places.



$$\tan 72 = \frac{x}{1560}$$

$$x \approx 4801.19 \text{ ft away}$$