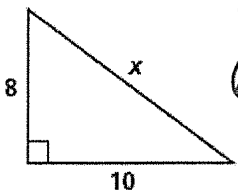
Right Triangle and Trigonometry Unit Review (1) Name: Key

I can use Pythagorean Theorem and special right triangles relations to solve for missing side

Example: Find the values of the variables. Leave your answers in simplest radical form.

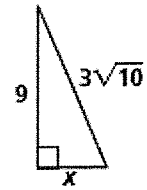


$a^2+b^2=c^2$

$64+100=c^2$

$c^2=164$

$\boxed{c=2\sqrt{41}}$



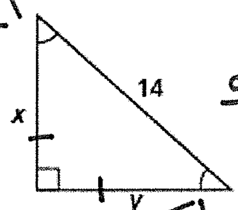
$a^2+b^2=c^2$ $(3\sqrt{10})^2$

$x^2+81=90$ $9\cdot 10$

$x^2=9$

$\boxed{x=3}$

SRT

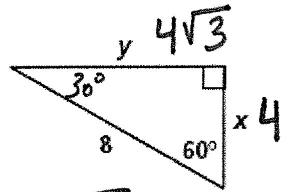


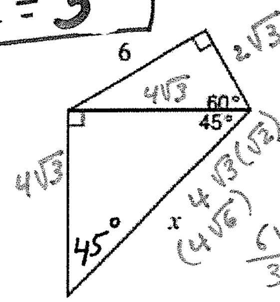
$\frac{2x^2}{2}=\frac{196}{2}$

$x^2=98$

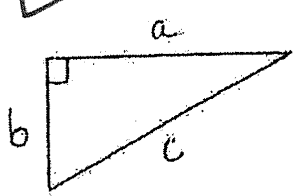
$\boxed{x=\sqrt{98}}=\boxed{7\sqrt{2}}$

* $x=\frac{14}{\sqrt{2}}$ $\boxed{x=7\sqrt{2}}$



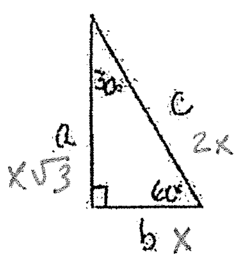


$4\sqrt{3}(\sqrt{2})$ $(4\sqrt{6})$ $\frac{6\sqrt{3}}{3}=2\sqrt{3}$



Find the missing side lengths. Use simple radical form when needed.

1. $a=12,\ c=16$ $b=\sqrt{112}$ $b=4\sqrt{7}$
2. $a=14,\ b=16$ $c=\sqrt{452}$ $c=2\sqrt{113}$
3. $a=8,\ c=17$
4. $b=13,\ c=15$ $a=\sqrt{56}$ $\boxed{a=2\sqrt{14}}$
5. $a=2\sqrt{3},\ b=4$ $12+16=c^2$ $28=c^2$ $\boxed{c=\sqrt{28}}$
6. $b=11,\ c=\sqrt{170}$ $121+a^2=170$ $a^2=59$ $\boxed{a=\sqrt{59}}$



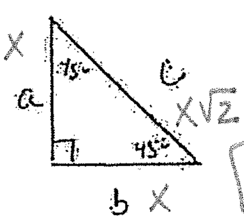
Find the 2 missing sides of the $30°-60°-90°\ \Delta$ using the given info.

14. $c=40$ $b=20$ $a=20\sqrt{3}$

15. $a=6\sqrt{3}$ $b=6$ $c=12$

16. $b=9$ $c=18$ $a=9\sqrt{3}$

17. $a=5$ $b=\frac{5}{\sqrt{3}}=\frac{5\sqrt{3}}{3}$ $c=\frac{10\sqrt{3}}{3}$



Find the 2 missing sides of the $45°-45°-90°\ \Delta$ using the given info.

18. $a=6$ $\boxed{b=6}$ $\boxed{c=6\sqrt{2}}$

19. $b=8\sqrt{2}$ $\boxed{a=8\sqrt{2}}$ $c=(8\sqrt{2})(\sqrt{2})$ $\boxed{c=16}$

20. $c=50$ $a=\frac{50}{\sqrt{2}}$ $\boxed{a=b=25\sqrt{2}}$

21. $c=11\sqrt{2}$ $\boxed{a=b=11}$

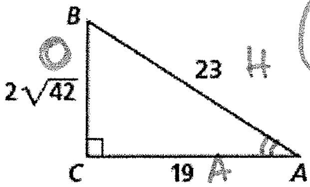
I can determine the ratio of sin Θ, cos Θ and tan Θ, when Θ is an acute angle of a right triangle and the sides of the triangle are given.

SOH CAH TOA ②

Example: Express sin *A*, cos *A*, and tan *A* as ratios.

Just write the Ratio

9.

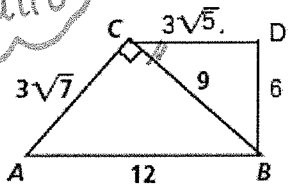


$\text{Sin } A = $

$\text{Cos } A = \frac{2\sqrt{42}}{23}$

$\text{Tan } A = \frac{2\sqrt{42}}{19}$

10.



sin<ABC= $\frac{3\sqrt{7}}{12}$

cos<BCD= $\frac{3\sqrt{5}}{9}$

tan<BAC= $\frac{9}{3\sqrt{7}}$

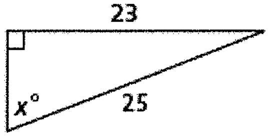
sin<CBD= $\frac{3\sqrt{7}}{12}$

tan<BCD= $\frac{6}{3\sqrt{5}}$

I can use SOHCAHTOA to find the measure of a missing side or a missing angle of a right triangle

Example: Find the value of *x*. Round lengths of segments to the nearest tenth and angle measures to the nearest degree.

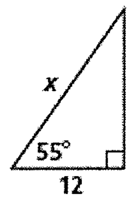
11.



$\sin x° = \frac{23}{25}$

$\boxed{\angle x° = 67°}$

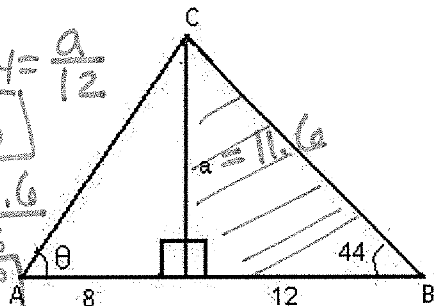
12.



$\cos 55° = \frac{12}{x}$

$\boxed{x = 20.9}$

13.



$\tan 44 = \frac{a}{12}$

$\boxed{a = 11.6}$

$\tan \theta = \frac{11.6}{8}$

$\boxed{\angle \theta = 55.4°}$

For 23 – 31, find x. If x is a side length, round to the tenths place. If x is an angle, round to the nearest degree.

23. $\sin x = \frac{2}{3}$

$\boxed{\angle x° = 41.8°}$

24. $\sin 17° = \frac{x}{7}$

$\boxed{x = 2.04}$

25. $\cos 83° = \frac{1}{x}$

$\boxed{x = 8.205}$

26. $\cos x = .39$

$\boxed{\angle x° = 67°}$

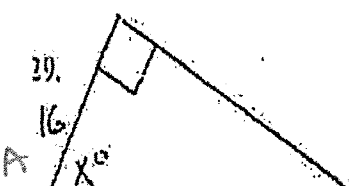
27. $\tan 76° = \frac{x}{3}$

$\boxed{x = 12}$

28. $\tan x = .9$

$\boxed{\angle x° = 42°}$

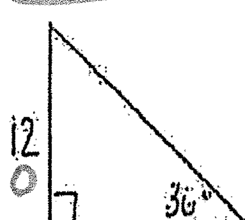
29.



$\cos x° = \frac{16}{20}$

$\boxed{\angle x° = 37°}$

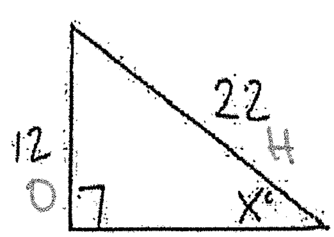
30.



$\tan 36° = \frac{12}{x}$

$\boxed{x = 16.5}$

31.



$\sin x° = \frac{12}{22}$

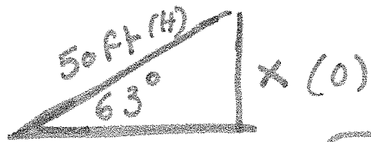
$\boxed{\angle x° = 33°}$

3 "Story problems"

I can solve different situations applying properties of right triangle.

not important

14. A surveyor measures the top of a building 50 ft away from him. His angle-measuring device is 4 ft above ground. The angle of elevation to the top of the building is 63°. How tall is the building?

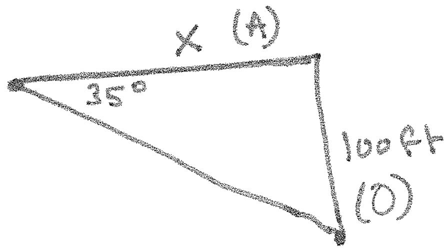


$\sin 63° = \frac{x}{50}$

$0.89 = \frac{x}{50}$

$\boxed{x = 44.5\text{ ft}}$

15. A forest ranger looking out from a ranger's station can see a forest fire at a 35° angle of depression. The ranger's position is 100 ft above the ground. How far is it from the ranger's station to the fire?

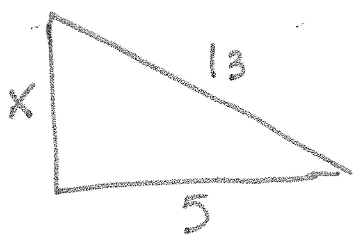


$\tan 35° = \frac{100}{x}$

$0.7 = \frac{100}{x}$

$\boxed{x = 142.86\text{ ft}}$

10. Ms. Green tells you that a right triangle has a hypotenuse of 13 and a leg of 5. She asks you to find the other leg of the triangle. What is your answer?

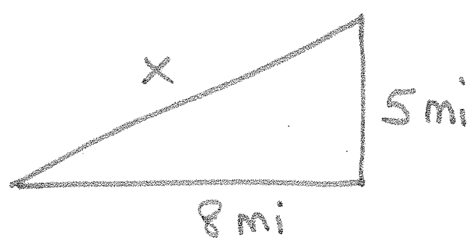


$x^2 + 25 = 169$

$x^2 = 144$

$\boxed{x = 12}$

11. Two joggers run 8 miles north and then 5 miles west. What is the shortest distance, to the nearest tenth of a mile, they must travel to return to their starting point?

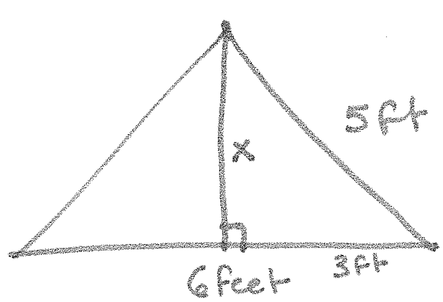


$25 + 64 = x^2$

$x^2 = 89$

$\boxed{x = 9.4\text{ miles}}$

12. Oscar's dog house is shaped like a tent. The slanted sides are both 5 feet long and the bottom of the house is 6 feet across. What is the height of his dog house, in feet, at its tallest point?

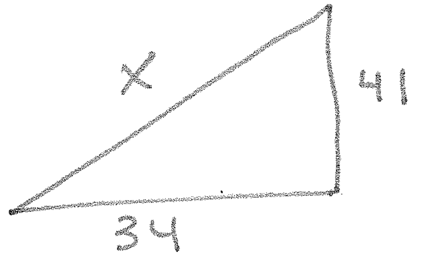


$25 + 9 = x^2$

$34 = x^2$

$\boxed{x = 5.83\text{ ft}}$

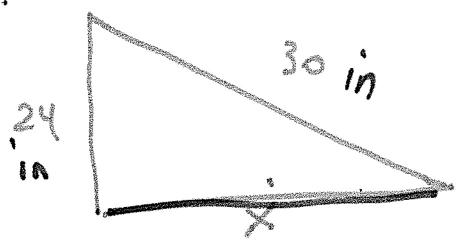
13. To get from point A to point B you must avoid walking through a pond. To avoid the pond, you must walk 34 meters south and 41 meters east. To the nearest meter, how many meters would be saved if it were possible to walk through the pond?



$a^2+b^2=c^2$

$\boxed{X = 53.26m}$

14. A suitcase measures 24 inches long and the diagonal is 30 inches long. How much material is needed to cover one side of the suitcase?



$a^2+b^2=c^2$

$576+b^2=900$

$\boxed{b=18 \text{ in}}$

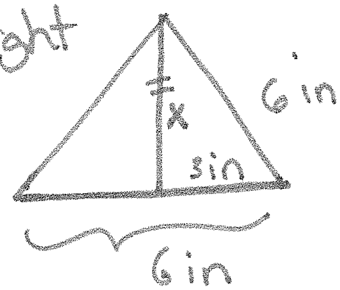
15. What is the height of an equilateral triangle with perimeter of 18 in?

x is the height

$x^2=36+9$

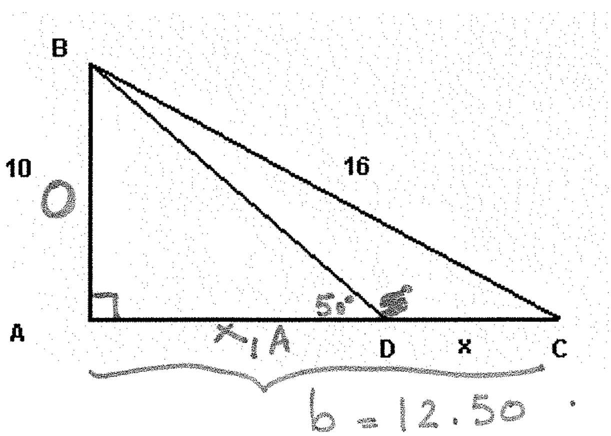
$x^2=45$

$\boxed{x=3\sqrt{5} \text{ in}}$



P = 18 in
meaning each side
is 6 in

If m<ADB= 50° and m<BAD = 90°, what is the value of x?



$a^2+b^2=c^2$

$100+b^2=256$

$b^2=156$

$\boxed{b=12.50}$

$\tan 50° = \frac{10}{x_1}$

$\boxed{x_1=8.391}$

$X = b - x_1$

$X = 12.50 - 8.391$

$\boxed{X \approx 4.109}$