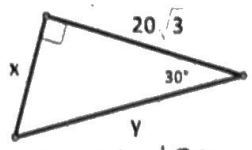
Name: M

Unit 5 Review Worksheet

Special Right Triangles:

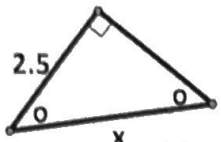
1. Solve for the missing side using the proportions of 45-45-90 and 30-60-90 triangles. Leave your answers as a simplified radical:



30 | 60 | 90
x | x√3 | 2x

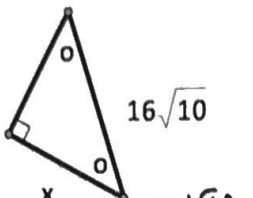
x = 20

y = 40



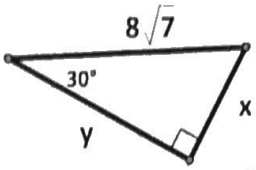
45 | 45 | 90
x | x | x√2

x = 2.5√2



45 | 45 | 90
x | x | x√2

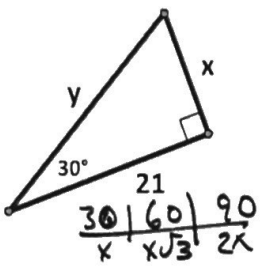
x = 16√5



30 | 60 | 90
x | x√3 | 2x

x = 4√7

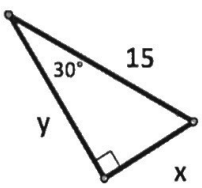
y = 4√21



30 | 60 | 90
x | x√3 | 2x

x = 7√3

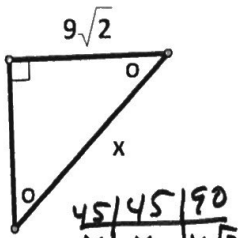
y = 14√3



30 | 60 | 90
x | x√3 | 2x

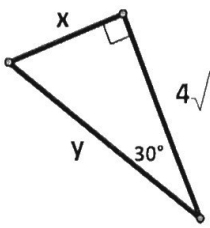
x = 7½ or 7.5

y = 7.5√3



45 | 45 | 90
x | x | x√2

x = 18



30 | 60 | 90
x | x√3 | 2x

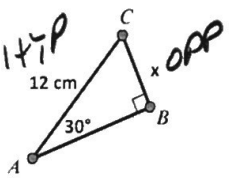
x = 4√2

y = 8√2

Trigonometry:

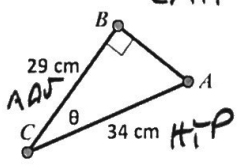
2. Label the sides based of the triangle using the reference angle -- (O) for Opposite, (A) for Adjacent and (H) for Hypotenuse. Then choose which trigonometric ratio that you would use to solve for the missing side or angle.

a)



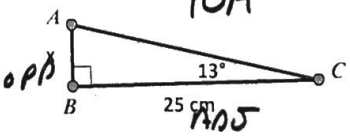
SIN COS TAN

b) CAH



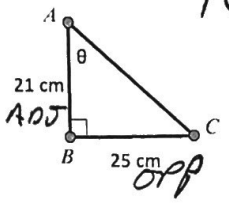
SIN COS TAN

c) TOA



SIN COS TAN

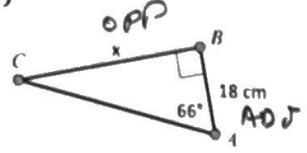
d) TOA



SIN COS TAN

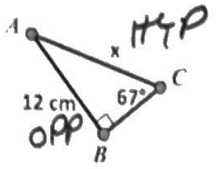
Name: M

e) TOA



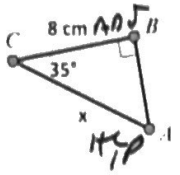
SIN COS (TAN)

f) SOH



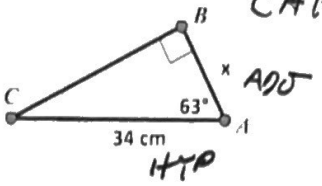
(SIN) COS TAN

g) CAH



SIN (COS) TAN

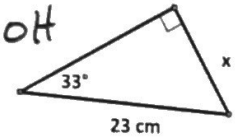
h) CAH



SIN (COS) TAN

3. Solve for the missing information. (Round all side lengths to the nearest hundredth and angles to the nearest degree)
Remember: angles are inverse!

a) SOH



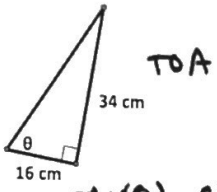
$\sin(\theta) = \frac{OPP}{HYP}$

$\sin(33) = \frac{x}{23}$

$x = 23 \cdot \sin(33)$

$x \approx 12.5$

b) TOA



$\tan(\theta) = \frac{OPP}{ADJ}$

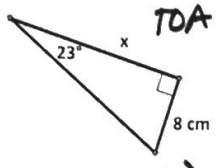
$\tan(\theta) = \frac{34}{16}$

$\angle\theta = \tan^{-1}\left(\frac{34}{16}\right)$

$\theta \approx 64.8^\circ$

$\theta = 65^\circ$

c) TOA



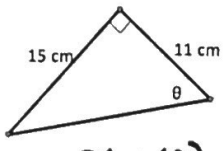
$\tan(\theta) = \frac{OPP}{ADJ}$

$\tan(23) = \frac{8}{x}$

$x = \frac{8}{\tan(23)}$

$x \approx 18.8$

d) TOA



$\tan(\theta) = \frac{OPP}{ADJ}$

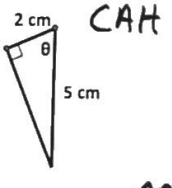
$\tan(\theta) = \frac{15}{11}$

$\angle\theta = \tan^{-1}\left(\frac{15}{11}\right)$

$\angle\theta \approx 53.7^\circ$

$\theta = 54^\circ$

e) CAH



$\cos\theta = \frac{ADJ}{HYP}$

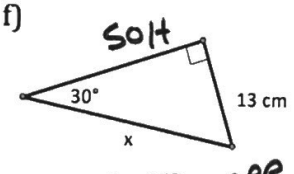
$\cos(\theta) = \frac{2}{5}$

$\angle\theta = \cos^{-1}\left(\frac{2}{5}\right)$

$\angle\theta \approx 66.4^\circ$

$\theta = 66^\circ$

f) SOH



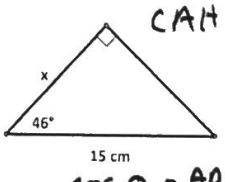
$\sin\theta = \frac{OPP}{HYP}$

$\sin(30) = \frac{13}{x}$

$x = \frac{13}{\sin(30)}$

$x \approx 26$

g) CAH



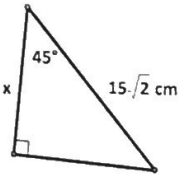
$\cos\theta = \frac{ADJ}{HYP}$

$\cos(46) = \frac{x}{15}$

$x = 15 \cdot \cos(46)$

$x \approx 10.4$

h)



$\cos\theta = \frac{ADJ}{HYP}$

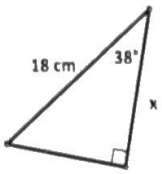
$\cos(45) = \frac{x}{15\sqrt{2}}$

$x = 15\sqrt{2} \cdot \cos(45)$

$x = 15$

Name: _____

i) CAH



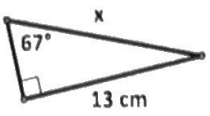
$\cos\theta = \frac{adj}{hyp}$

$\cos(38) = \frac{x}{18}$

$x = 18 \cdot \cos(38)$

$x \approx 14.2$

j) SOH



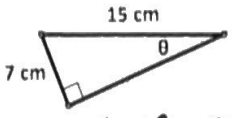
$\sin\theta = \frac{opp}{hyp}$

$\sin(67) = \frac{13}{x}$

$x = \frac{13}{\sin(67)}$

$x \approx 14.1$

k) SOH



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

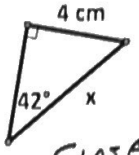
$\sin(\theta) = \frac{7}{15}$

$\angle\theta = \sin^{-1}\left(\frac{7}{15}\right)$

$\theta \approx 27.8°$

$\theta = 28°$

l) SOH



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

$\sin(42) = \frac{4}{x}$

$x = \frac{4}{\sin(42)}$

$x \approx 5.977$

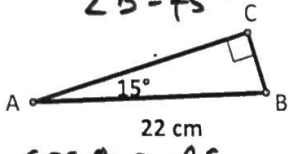
$x \approx 6.0$

4) Solve each right triangle:

$\angle A + \angle B = 90$

$15 + \angle B = 90$

$\angle B = 75°$



$\sin A = \frac{CB}{AB}$

$\sin(15) = \frac{CB}{22}$

$\overline{CB} = 22 \cdot \sin(15)$

$\overline{CB} = 5.7\text{ cm}$

$\cos A = \frac{AC}{AB}$

$\cos(15) = \frac{AC}{22}$

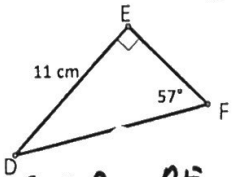
$\overline{AC} = 22 \cdot \cos(15)$

$\overline{AC} = 21.3\text{ cm}$

$\angle D + \angle F = 90$

$\angle D + 57 = 90$

$\angle D = 33°$



$\cos D = \frac{DE}{DF}$

$\cos(33) = \frac{11}{DF}$

$\overline{DF} = \frac{11}{\cos(33)}$

$\overline{DF} = 13.1\text{ cm}$

$\tan F = \frac{DE}{EF}$

$\tan(57) = \frac{11}{EF}$

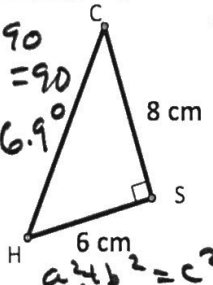
$\overline{EF} = \frac{11}{\tan(57)}$

$EF = 7.1\text{cm}$

$\angle C + \angle H = 90$

$\angle C + 53.1 = 90$

$\angle C = 36.9°$



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

$(8)^2 + (6)^2 = (CH)^2$

$\overline{CH} = 10$

$\tan(H) = \frac{CS}{HS}$

$\tan(H) = \frac{8}{6}$

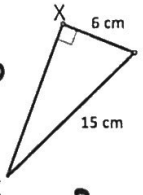
$\angle H = \tan^{-1}\left(\frac{8}{6}\right)$

$\angle H = 53.1°$

$\angle T + \angle Z = 90$

$66.4 + \angle Z = 90$

$\angle Z = 23.6°$



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

$(6)^2 + (XZ)^2 = (15)^2$

$\overline{XZ} = \sqrt{189} \approx 13.7\text{cm}$

$\cos Y = \frac{XY}{ZY}$

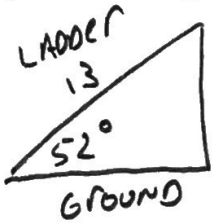
$\cos(Y) = \frac{6}{15}$

$\angle Y = \cos^{-1}\left(\frac{6}{15}\right)$

$\angle Y = 66.4°$

5) Trig Word Problems Draw a picture for each and solve. Round lengths to the nearest tenth and angles to the nearest degree.

a) A 13 foot ladder is propped up against a wall. If the ladder forms a 52° angle of elevation with the ground, how high up the wall does the ladder reach?



WALL
h

SOH

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

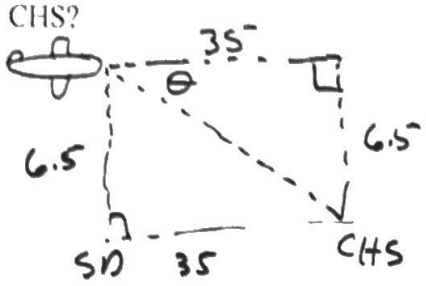
$\sin(52) = \frac{h}{13}$

$h = 13 \cdot \sin(52)$

$h \approx 10.2\text{ft}$

Name: _____

b) An airplane is directly over San Diego Airport. If the plane is 6.5 miles above the ground and Carlsbad High School is 35 miles from San Diego Airport, what is the angle of depression from the plane to CHS?



TOA

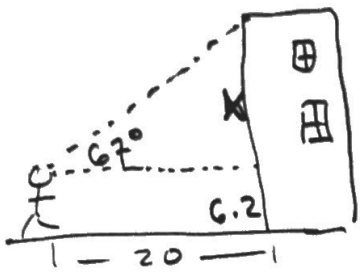
$\tan\theta = \frac{OPP}{ADJ}$

$\tan(\theta) = \frac{6.5}{35}$

$\angle\theta = \tan^{-1}\left(\frac{6.5}{35}\right)$

$\angle\theta \approx 10.5^\circ$

c) A 6.2 ft tall man creates a 67° angle of elevation when he looks up to the top of a building. If he is standing 20 feet from the building, how tall is the building?



TOA

$\tan\theta = \frac{OPP}{ADJ}$

$\tan(67) = \frac{x}{20}$

$x = 20 \cdot \tan(67)$

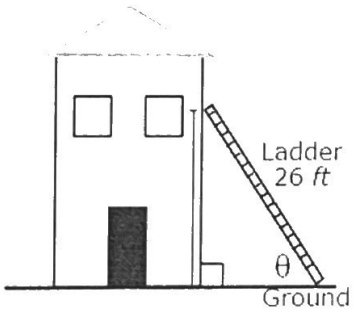
$x \approx 47.1 ft$

BUT TOTAL HEIGHT IS MAN + BUILDING

$= 6.2 + 47.1$

$= 53.3 ft$ HIGH

6. Kim uses a 26-foot ladder to paint a section of her house that is 10 feet off the ground. Choose **all** equations that can be used to solve for θ.



A. $\sin\theta = \frac{10}{26}$

B. $\cos\theta = \frac{10}{26}$

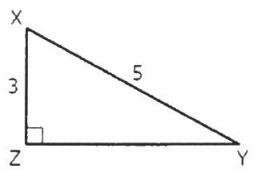
C. $\tan\theta = \frac{10}{26}$

D. $\sin\theta = \frac{24}{26}$

E. $\cos\theta = \frac{24}{26}$

F. $\tan\theta = \frac{24}{26}$

7. Consider this right triangle.

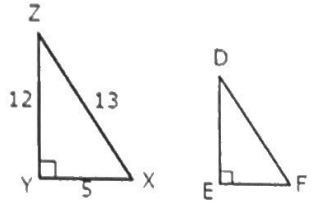


Decide whether each expression can be used to find the length of ZY . Mark **Yes** or **No** for each expression.

	Yes	No
5sin(Y)		X
5cos(Y)	X	
3tan(Y)		X
3tan(X)	X	

Name: _____

8. Triangle DEF is similar to triangle ZYX. Choose all angles whose tangent equals $\frac{5}{12}$.



A. $\angle D$

B. $\angle E$

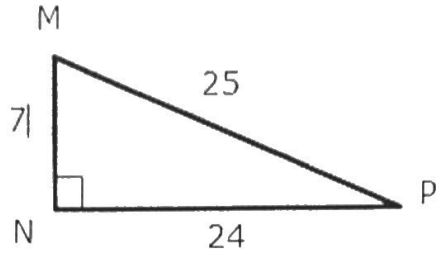
C. $\angle F$

D. $\angle X$

E. $\angle Y$

F. $\angle Z$

9. Consider this right triangle. Determine whether each equation is correct. Mark **Yes** or **No** for each equation.



	Yes	No
$\sin(M) = \frac{24}{25}$	X	
$\cos(M) = \frac{24}{25}$		X
$\sin(P) = \frac{7}{25}$	X	
$\cos(P) = \frac{24}{25}$	X	

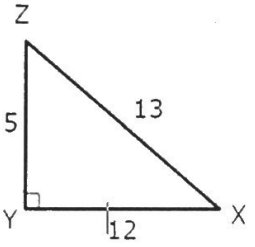
10. Consider this right triangle. What is the value of cos(Z)?

A. $\frac{12}{13}$

B. $\frac{5}{13}$

C. $\frac{5}{12}$

D. $\frac{13}{5}$



CAH

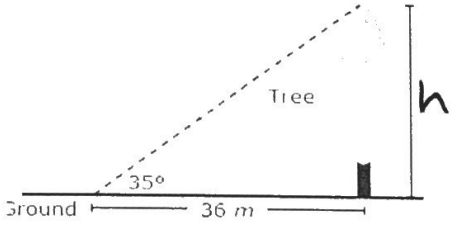
$\cos\theta = \frac{ADJ}{HYP}$

$\cos(Z) = \frac{5}{13}$

11.

David wants to calculate the height of a tree. He makes the following measurements:

- The length of the tree's shadow is 36 meters.
- The angle of elevation from the ground to the top of the tree is 35°.
- The tree stands perpendicular to the ground.



Find the height of the tree, in meters. Round your answer to the nearest whole meter.

TOA

$\tan\theta = \frac{OPP}{ADJ}$

$\tan(35) = \frac{h}{36}$

$h = 36 \cdot \tan(35)$

$h \approx 25.2 = 25$