$S\frac{O}{H}\ C\frac{A}{H}\ T\frac{O}{A}$ $\quad C\frac{H}{O}\ S\frac{H}{A}\ C\frac{A}{O}$

Pre-Cal
Review 1.1 – 1.4

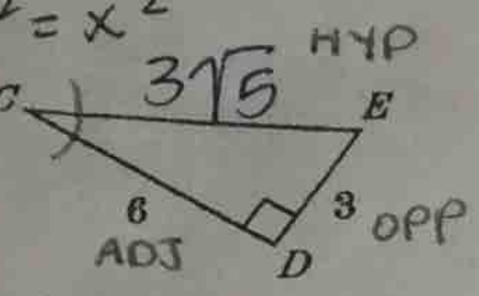
Name: _____
Date: _____ Period: _____

Study your notes & homeworks from this unit! Give all answers as simplified fractions or in simplified radical form, unless otherwise noted.

1.1 Right Triangle Trig

1. Using $\triangle CED$, find the values of the six trig functions for $\measuredangle C$:

$6^2+3^2=x^2$
$\sqrt{45}=\sqrt{x^2}$
$\sqrt{45}=x$
$9\ 5$



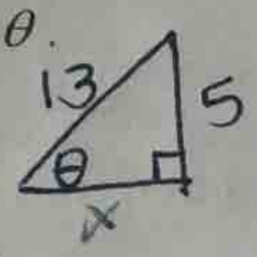
$\frac{O}{H}$ $\sin C=\frac{3}{3\sqrt{5}}=\boxed{\frac{1}{\sqrt{5}}}$ $\quad \frac{H}{O}$ $\csc C=\boxed{\sqrt{5}}$

$\frac{A}{H}$ $\cos C=\frac{6}{3\sqrt{5}}=\boxed{\frac{2}{\sqrt{5}}}$ $\quad \frac{H}{A}$ $\sec C=\boxed{\frac{\sqrt{5}}{2}}$

$\frac{O}{A}$ $\tan C=\frac{3}{6}=\boxed{\frac{1}{2}}$ $\quad \frac{A}{O}$ $\cot C=\boxed{2}$

2. If $\sin\theta=\frac{5}{13}$, find $\cos\theta$.

$\frac{OPP}{HYP}$

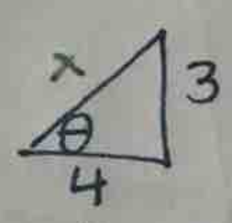


$5^2+x^2=13^2$
$x^2=144$
$x=12$

$\cos\theta=\frac{ADJ}{HYP}=\boxed{\frac{12}{13}}$

3. If $\tan\theta=\frac{3}{4}$, find $\sin\theta$.

$\frac{OPP}{ADJ}$



$3^2+4^2=x^2$
$25=x^2$
$5=x$

$\sin\theta=\frac{OPP}{HYP}=\boxed{\frac{3}{5}}$

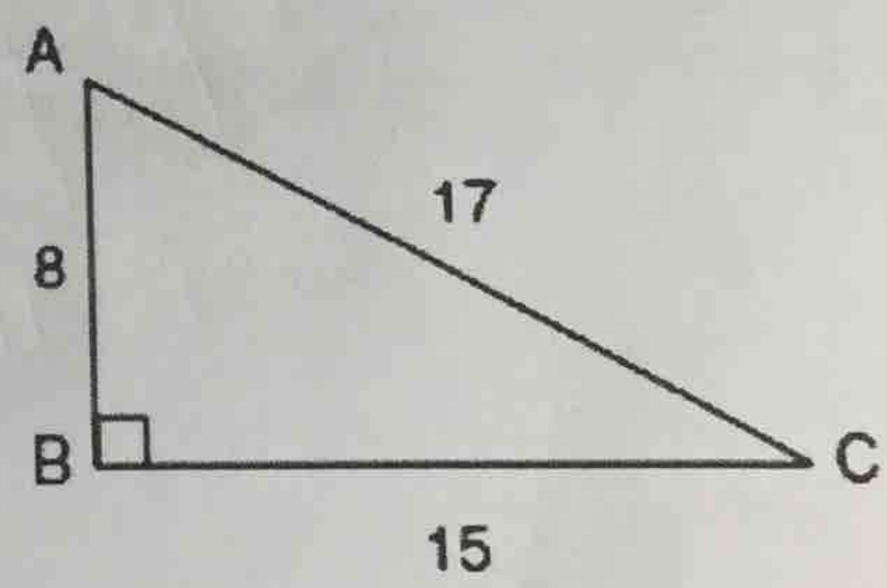
For problems 4-7, use the diagram of $\triangle ABC$ to fill in the missing angle letter:

4. $\sin\measuredangle$ A $=\frac{15}{17}$ $\frac{OPP}{HYP}$

5. $\csc\measuredangle$ C $=\frac{17}{8}$ $\frac{HYP}{OPP}$

6. $\cot\measuredangle$ C $=\frac{15}{8}$ $\frac{ADJ}{OPP}$

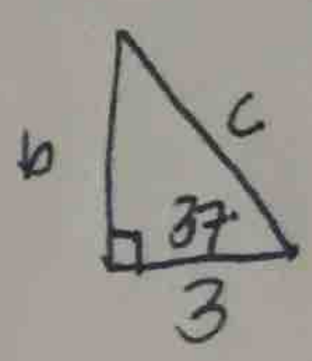
7. $\sec\measuredangle$ C $=\frac{17}{15}$ $\frac{HYP}{ADJ}$



1.2 Solving Right Triangles

Find all missing side lengths & angle measures.

8. a = 3, m<B = 37°

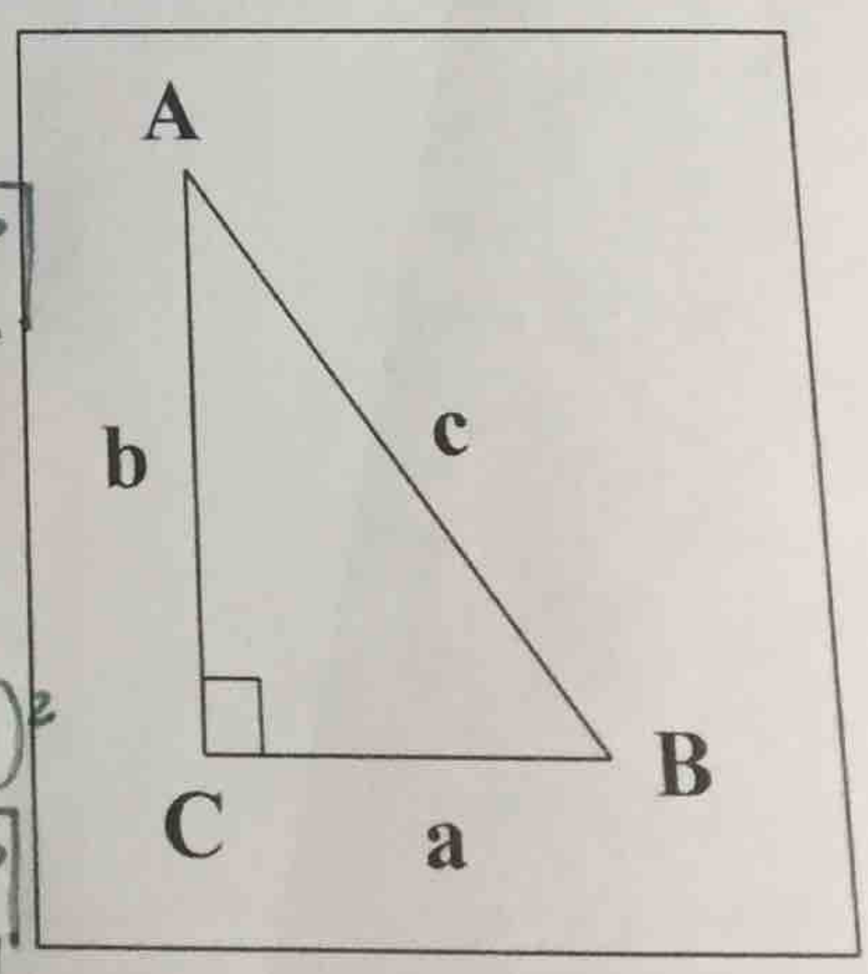


$a=3$
$b=2.261$
$c=3.756$

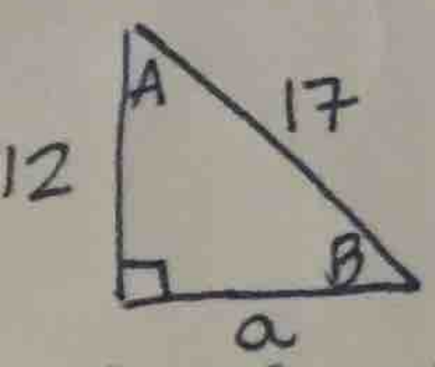
$m\angle A=90-37=53°$
$m\angle B=37°$
$m\angle C=90°$

$\cos 37=\frac{3}{c}$
$c=\frac{3}{\cos 37}$

$a^2+b^2=c^2$
$3^2+b^2=(3.756)^2$



9. b = 12, c = 17



$a=12.042$
$b=12$
$c=17$

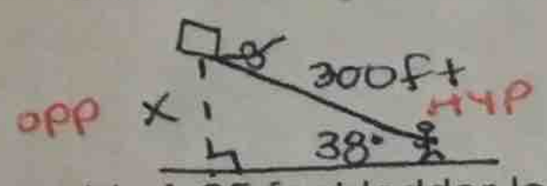
$m\angle A=90-45=45°$
$m\angle B=45°$
$m\angle C=90°$

$a^2+12^2=17^2$
$a=\sqrt{145}$
$a=12.042$

$\sin B=\frac{12}{17}$
$B=\sin^{-1}\left(\frac{12}{17}\right)$

1.3 Trig Applications

10. A boy flying a kite lets out 300 feet of string which makes an angle of 38° with the ground. Assuming that the string is straight, how high above the ground is the kite?

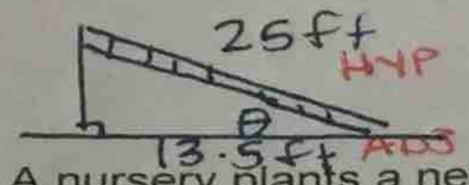


$\sin 38 = \frac{x}{300}$

$300 \sin 38 = x$

$\boxed{184.698 \text{ ft}}$

11. A 25 foot ladder leans against a building. The ladder's base is 13.5 feet from the building. Find the angle which the ladder makes with the ground.

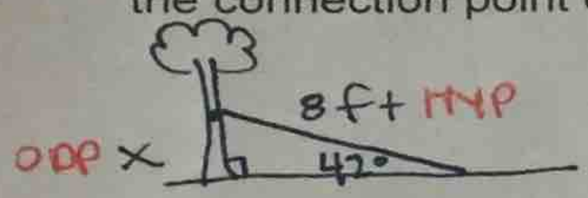


$\cos\theta = \frac{13.5}{25}$

$\theta = \cos^{-1}\left(\frac{13.5}{25}\right)$

$\boxed{57.3°}$

12. A nursery plants a new tree and attaches a guy wire to help support the tree while its roots take hold. An eight foot wire is attached to the tree and to a stake in the ground. From the stake in the ground the angle of elevation of the connection with the tree is 42°. Find to the *nearest tenth of a foot*, the height of the connection point on the tree.

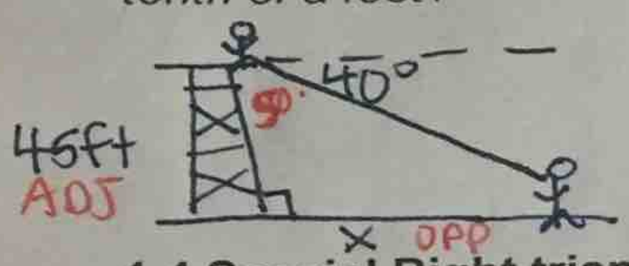


$\sin 42 = \frac{x}{8}$

$8 \sin 42 = x$

$\boxed{5.4 \text{ ft}}$

13. From the top of a fire tower, a forest ranger sees his partner on the ground at an angle of depression of 40°. If the tower is 45 feet in height, how far is the partner from the base of the tower, to the *nearest tenth of a foot*?



$\tan 50 = \frac{x}{45}$

$45 \tan 50 = x$

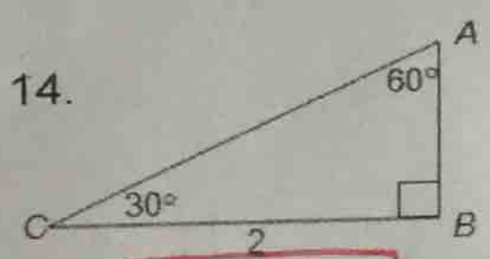
$\boxed{53.6 \text{ ft}}$

1.4 Special Right triangles

30	60	90
x	$x\sqrt{3}$	2x

45	45	90
x	x	$x\sqrt{2}$

14.



AB	BC	AC
30	60	90
x	$x\sqrt{3}$	2x
	2	

$2x = 2\left(\frac{2}{\sqrt{3}}\right)$

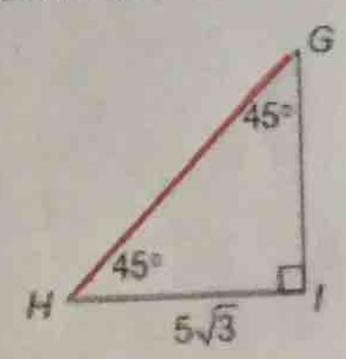
$\frac{x\sqrt{3}}{\sqrt{3}} = \frac{2}{\sqrt{3}}$

$x = 2/\sqrt{3}$

AB = $2/\sqrt{3}$

AC = $4/\sqrt{3}$

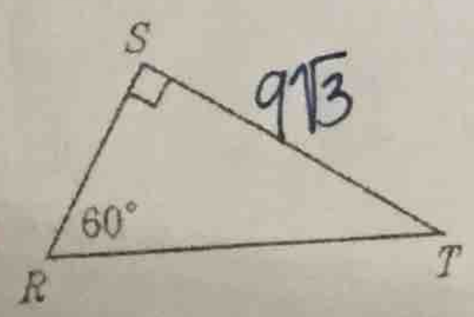
15. Find GH.



GI	HI	HG
45	45	90
x	x	$x\sqrt{2}$
	$5\sqrt{3}$	

HG: $(5\sqrt{3})(\sqrt{2}) = \boxed{5\sqrt{6}}$

16. If $ST = 9\sqrt{3}$, find the length of SR and RT



SR	ST	RT
30	60	90
x	$x\sqrt{3}$	2x
	$9\sqrt{3}$	

$\frac{x\sqrt{3}}{\sqrt{3}} = \frac{9\sqrt{3}}{\sqrt{3}}$

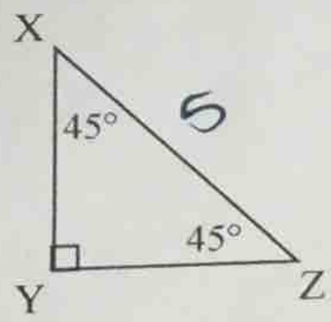
$x = 9$

$2(9) = 18$

SR = 9

RT = 18

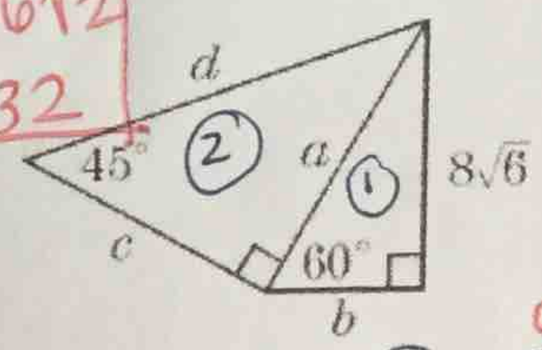
18. If XZ = 5, find YZ.



XY	YZ	XZ
45	45	90
x	x	$x\sqrt{2}$
		5

$\frac{x\sqrt{2}}{\sqrt{2}} = \frac{5}{\sqrt{2}}$

19. Find a, b, c, and d.



a = $16\sqrt{2}$

b = $8\sqrt{2}$

c = $16\sqrt{2}$

d = 32

①

b	$8\sqrt{6}$	a
30	60	90
x	$x\sqrt{3}$	2x

$\frac{x\sqrt{3}}{\sqrt{3}} = \frac{8\sqrt{6}}{\sqrt{3}}$

$x = 8\sqrt{2}$

$2x = 16\sqrt{2}$

②

a	c	d
45	45	90
x	x	$x\sqrt{2}$
$16\sqrt{2}$		

$x\sqrt{2} = (16\sqrt{2})(\sqrt{2}) = 16 \cdot \sqrt{4} = 32$