Bell work

Convert: 20 mph to inches per second

$$20\,\frac{mi}{hr}\left(\frac{1\,hr}{60\,min}\right)\left(\frac{1\,min}{60\,sec}\right)\left(\frac{5280\,ft}{mi}\right)\left(\frac{12\,in}{1\,ft}\right)=352\,in/sec$$

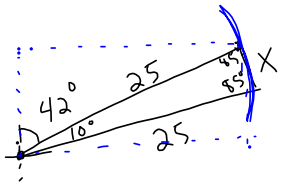
27) $S = r\theta$

$1.5 = r\left(\frac{\pi}{4}\right)$

$\frac{4}{\pi}(1.5) = r$

$r \approx 1.9$ ft

43)



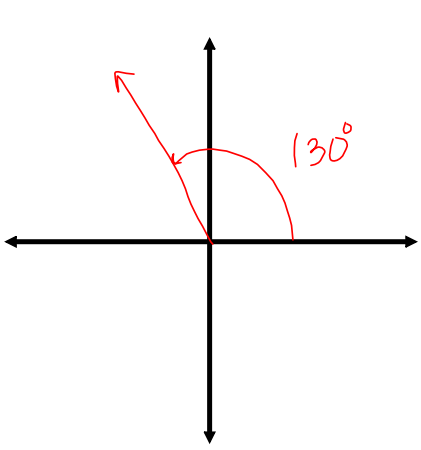
$x^2 = 25^2 + 25^2 - 2(25)(25)\cos 10°$

$S = r\theta$

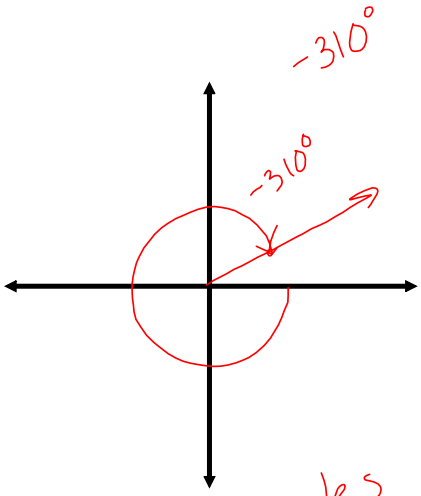
$S = 25\left(10°\left(\frac{\pi}{180°}\right)\right)$

$S = 4.3$ mi

Graphing an angle in standard position.

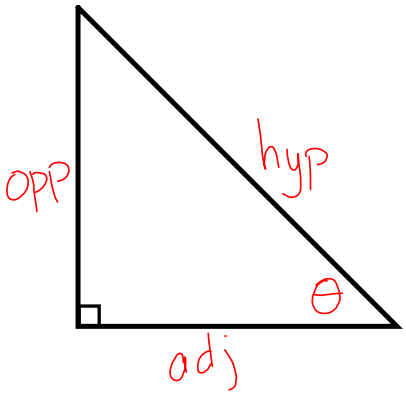


(+) angles
Counter Clockwise



(-) angles
clockwise

Quick Review of the six trigonometric functions of a right triangle.



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

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

$\tan\theta = \frac{opp}{adj}$

reciprocal

cosecant

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

secant

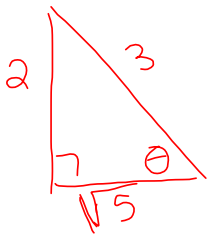
$\sec\theta = \frac{hyp}{adj}$

cotangent

$\cot\theta = \frac{adj}{opp}$

Assume that θ is an acute angle in a right triangle satisfying the given conditions. Evaluate the remaining trigonometric functions.

$\sin\theta = \frac{2}{3}$ $\frac{opp}{hyp}$



$x^2 + 2^2 = 3^2$

$x^2 = 9 - 4$

$x = \sqrt{5}$

$\cos\theta = \frac{\sqrt{5}}{3}$

$\tan\theta = \frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$

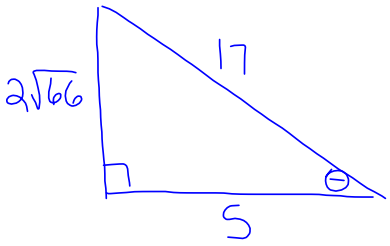
$\csc\theta = \frac{3}{2}$

$\sec\theta = \frac{3}{\sqrt{5}} = \frac{3\sqrt{5}}{5}$

$\cot\theta = \frac{\sqrt{5}}{2}$

Assume that θ is an acute angle in a right triangle satisfying the given conditions. Evaluate the remaining trigonometric functions.

$\sec\theta = \frac{17}{5}$



$\csc\theta = \frac{17}{2\sqrt{66}} \cdot \frac{\sqrt{66}}{\sqrt{66}} = \frac{17\sqrt{66}}{132}$

$\sin\theta = \frac{2\sqrt{66}}{17}$

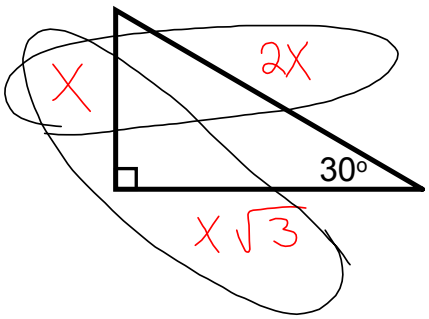
$\cos\theta = \frac{5}{17}$

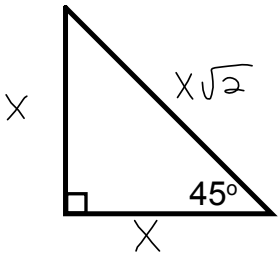
$\tan\theta = \frac{2\sqrt{66}}{5}$

$\cot\theta = \frac{5}{2\sqrt{66}} \cdot \frac{\sqrt{66}}{\sqrt{66}}$

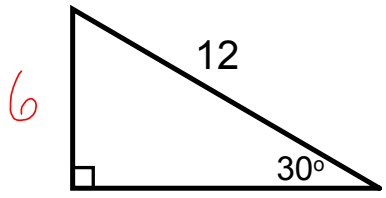
$\cot\theta = \frac{5\sqrt{66}}{132}$

Quick review of 30^o - 60^o - 90^o and 45^o - 45^o special triangles.



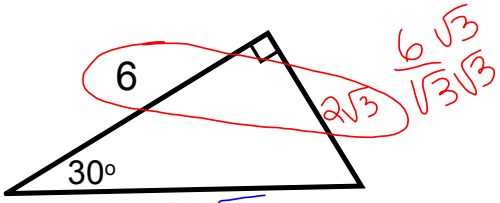


Find the lengths of the missing sides.



6

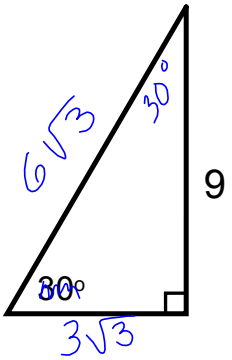
$6\sqrt{3}$



$2\sqrt{3}$

$\frac{6\sqrt{3}}{\sqrt{3}\sqrt{3}}$

$4\sqrt{3}$

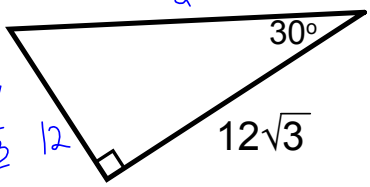


$6\sqrt{3}$

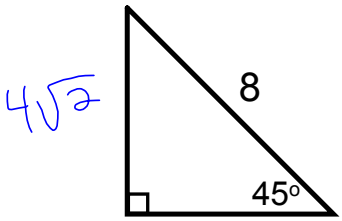
30°

$3\sqrt{3}$

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

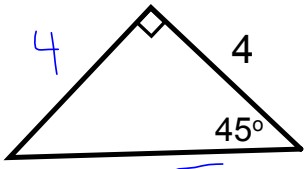


$\frac{12\sqrt{3}}{\sqrt{3}}$



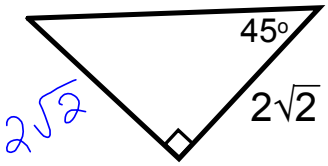
$4\sqrt{2}$

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



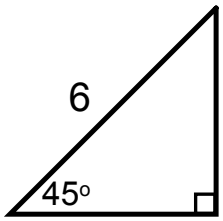
4

$4\sqrt{2}$



4

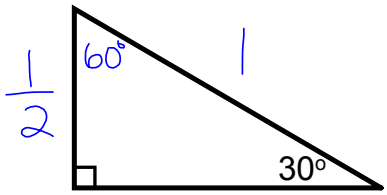
$2\sqrt{2}$

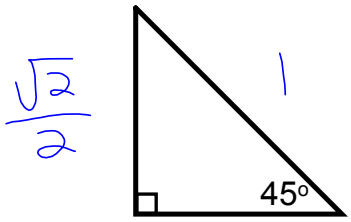


$\frac{6}{\sqrt{2}} \frac{\sqrt{2}}{\sqrt{2}}$

$3\sqrt{2}$

Hypotenuse of 1





Evaluate without using a calculator.

$\sin(45^\circ) = \frac{\sqrt{2}}{2}$

$\cos(\frac{\pi}{3}) = \frac{1}{2}$

$\cos(60^\circ)$

$\frac{\pi}{3}\left(\frac{180^\circ}{\pi}\right)$

$\frac{\pi}{6}\left(\frac{180^\circ}{\pi}\right) = 30^\circ$

$\frac{\pi}{4}\left(\frac{180^\circ}{\pi}\right) = 45^\circ$

$\tan(\frac{\pi}{3})$

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

$\csc(\frac{\pi}{6})$

$\csc(30^\circ)$

$\frac{1}{\frac{1}{2}} = 2$

$\sec(60^\circ) = 2$

$\cot(\frac{\pi}{4})$

$\cot(45^\circ) = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$

Evaluate using a calculator. Give an exact answer and not an approximate decimal. (show how to convert on calculator)

$\sin(45^\circ) = .707106$ $\cos(\frac{\pi}{3})$

$(.707)^2 = \sqrt{\frac{1}{2}} = \frac{1}{\sqrt{2}} \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

$\tan(\frac{\pi}{3}) = 1.73205$ $\csc(\frac{\pi}{6})$

$(1.73205)^2 = \sqrt{3}$

$\sec(60^\circ)$ $\cot(\frac{\pi}{4})$

$\frac{1}{\cos 60^\circ} = 2$

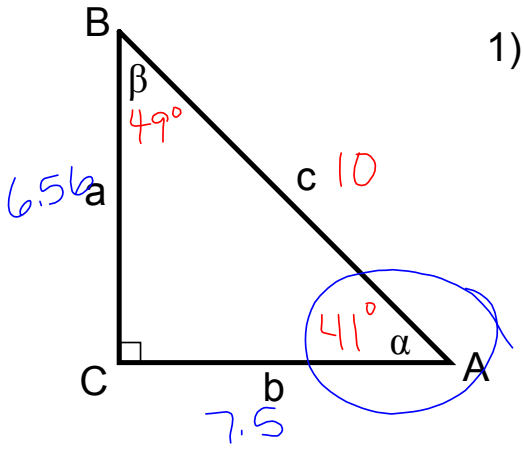
Find the acute angle θ that satisfies the given equation. Give your answer in both degrees and radians.

$\sin\theta = \frac{\sqrt{3}}{2}$ $60^\circ, \frac{\pi}{3}$

$\cot\theta = 1$ $45^\circ, \frac{\pi}{4}$

$\cos\theta = \frac{\sqrt{2}}{2}$ $= 45^\circ \quad \frac{\pi}{4}$

Solve the right triangle △ABC for all of its unknown parts.



1) $\alpha = 41^o$
$c = 10$

$\sin 41^\circ = \frac{a}{10}$

$10 \sin 41^\circ = a$

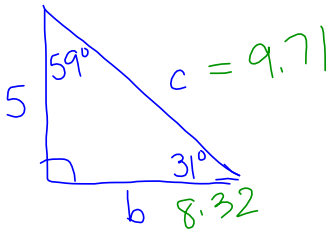
$a = 6.56$

$\cos 41^\circ = \frac{b}{10}$

$10 \cos 41^\circ = b$

$b = 7.5$

2) $\beta = 59^o$
$a = 5$



$(c)\cos 59^\circ = \frac{5}{c}(c)$

$c \cos 59^\circ = 5$

$c = \frac{5}{\cos 59^\circ}$

$\tan 59^\circ = \frac{b}{5}$

$5 \tan 59^\circ = b$

$b = 8.32$

Kirsten places her surveyor's telescope on the top of a tripod 5 feet above the ground. She measures an 8° elevation above the horizontal to the top of a tree that is 120 feet away. How tall is the tree?

tree $\Rightarrow$ 21.86 ft

$\tan 8° = \frac{x}{120}$

$120 \tan 8° = x$

$16.86 \text{ ft} = x$

Assignment: Section 4.2 Pg. 366

Quick Review 1-10

Exercises: 1, 5, 11, 15, 19 - 28,

29 - 57 odd, 61, 65, 69 - 72