SAT Question

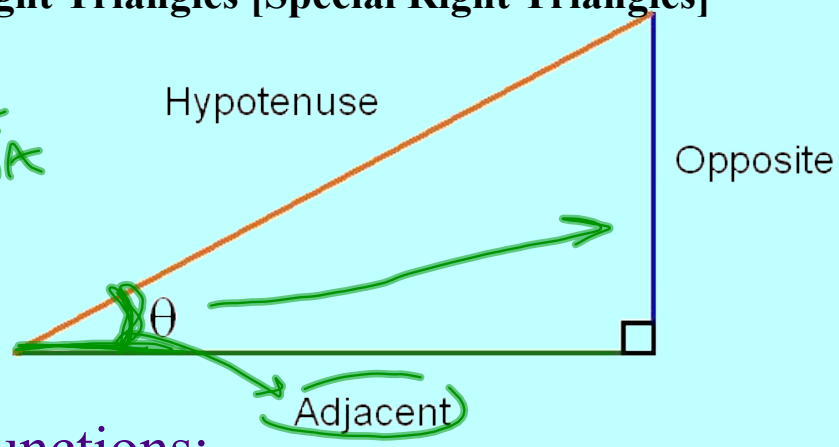
Noontime Temperatures in Hilo, Hawaii						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
66	78	75	69	78	77	70

The table above shows the temperatures, in degrees Fahrenheit, in a city in Hawaii over a one-week period. If m represents the median temperature, f represents the temperature that occurs most often, and a represents the average (arithmetic mean) of the seven temperatures, which of the following is the correct order of m, f, and a?

- (A) $a < m < f$
- (B) $a < f < m$
- (C) $m < a < f$
- (D) $m < f < a$
- (E) $a = m < f$

6.3 Solving Right Triangles [Special Right Triangles]

SOH CAH TOA



6 Trig Functions:

Sine θ = $\frac{O}{H}$ Cosecant θ = $\frac{H}{O}$

Cosine θ = $\frac{A}{H}$ Secant θ = $\frac{H}{A}$

Tangent θ = $\frac{O}{A}$ Cotangent θ = $\frac{A}{O}$

What did you notice? Reciprocals!

Cosecant = $\frac{1}{\sin}$ or $(\sin)^{-1} \neq \sin^{-1}$ (2nd sin)

Secant = $\frac{1}{\cos}$

Cotangent = $\frac{1}{\tan}$

*The calculator does not have specific buttons for these functions you must use the relationships above and the inverse button.

Be sure you are in DEGREE MODE when appropriate!!

Find the six trig functions for θ and α.

$\sin\theta = \frac{4}{5}$ $\csc\theta = \frac{5}{4}$

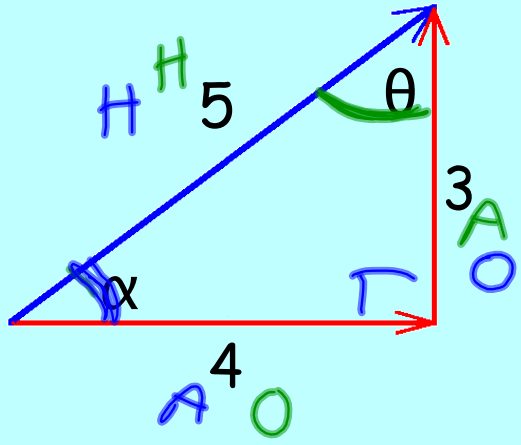
$\cos\theta = \frac{3}{5}$ $\sec\theta = \frac{5}{3}$

$\tan\theta = \frac{4}{3}$ $\cot\theta = \frac{3}{4}$

$\sin\alpha = \frac{3}{5}$ $\csc\alpha = \frac{5}{3}$

$\cos\alpha = \frac{4}{5}$ $\sec\alpha = \frac{5}{4}$

$\tan\alpha = \frac{3}{4}$ $\cot\alpha = \frac{4}{3}$



Now find the degree measures of θ and α.

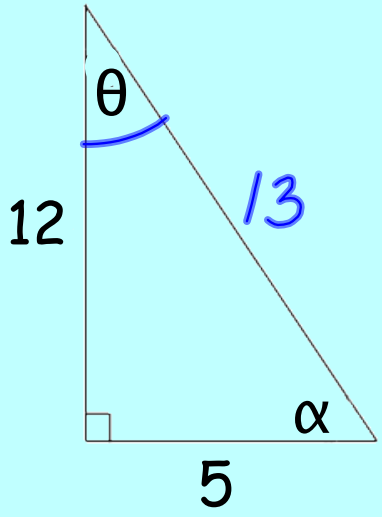
$\sin\theta = \frac{4}{5}$

$\theta = \sin^{-1}(4/5) = 53.1°$

$\alpha = \tan^{-1}(3/4)$

$\alpha = 36.8°$

Solve this triangle:



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

$\tan\theta = \frac{5}{12}$

$\theta = \tan^{-1}\left(\frac{5}{12}\right)$

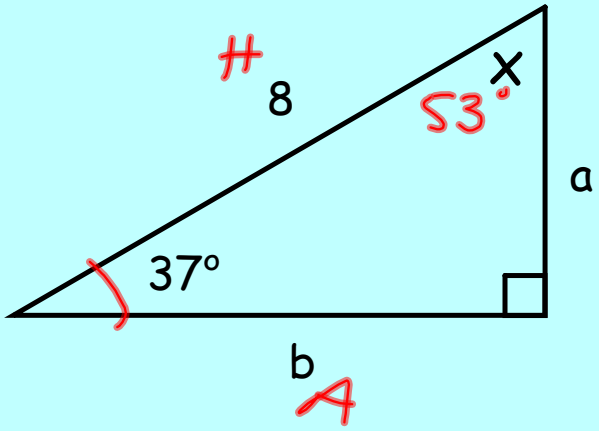
$= 22.6°$

$\alpha = 90 - 22.6$

$= 67.4°$

Solve this triangle:

$x = 90 - 37$
$= 53°$



$8 \cdot \sin 37 = \frac{a}{8} \cdot 8$

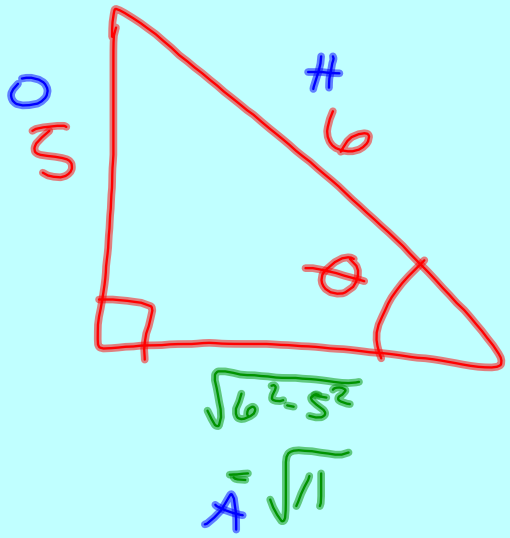
$a = 4.81$

$\cos 37 = \frac{b}{8}$

$b = 6.40$

Let θ be an acute angle such that sin θ = 5/6. Find the other five trig functions of θ.

O H



$\sin\theta = \frac{5}{6}$

$\cos\theta = \frac{\sqrt{11}}{6}$

$\tan\theta = \frac{5}{\sqrt{11}}$

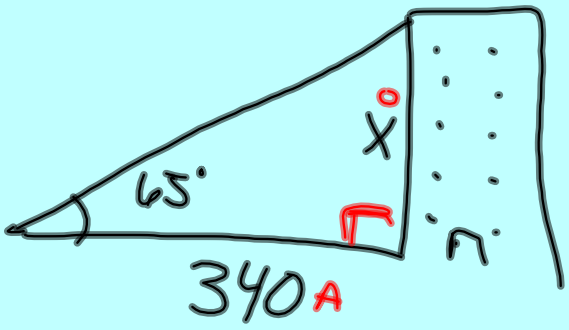
$\csc\theta = \frac{6}{5}$

$\sec\theta = \frac{6}{\sqrt{11}}$

$\cot\theta = \frac{\sqrt{11}}{5}$

From a point 340 feet away from the base of a tall building, the angle of elevation to the top of the building is 65°.

Find the height of the building.

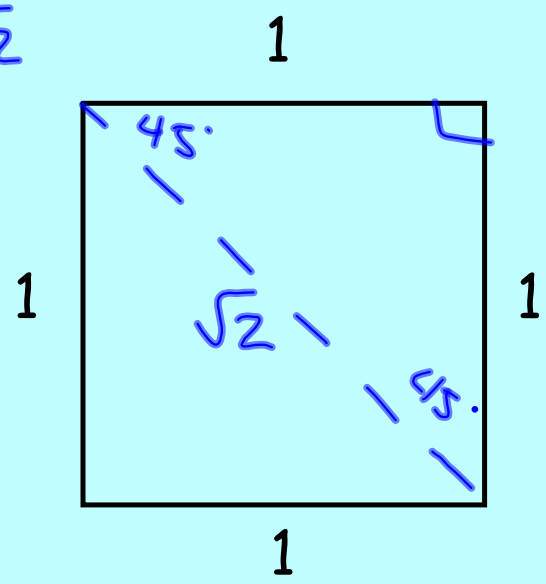


$\tan 65 = \frac{x}{340}$

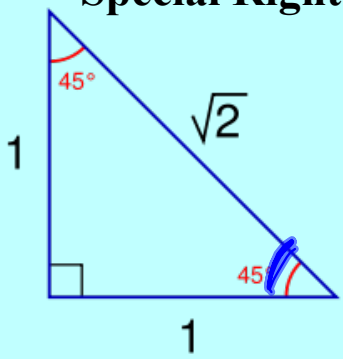
$x = 729$ ft.

Find the diagonal of a square whose sides have a length of one.

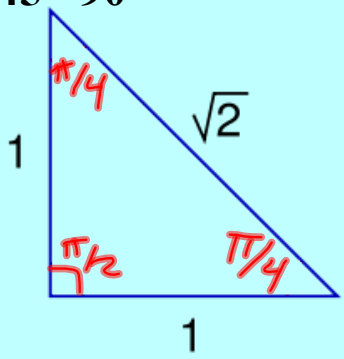
$\sqrt{1^2+1^2} = \sqrt{2}$



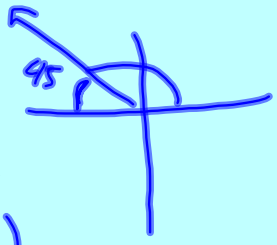
Special Right Triangles: 45 - 45 - 90



$\frac{\pi}{4} - \frac{\pi}{4} - \frac{\pi}{2}$



Ex.1

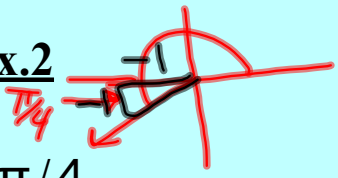


135*

(45°)

$\sin 135 = \frac{1}{\sqrt{2}}$

Ex.2



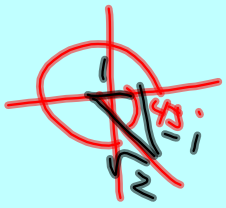
$5\pi/4$

$\tan \frac{5\pi}{4} = \frac{-1}{-1} = 1$

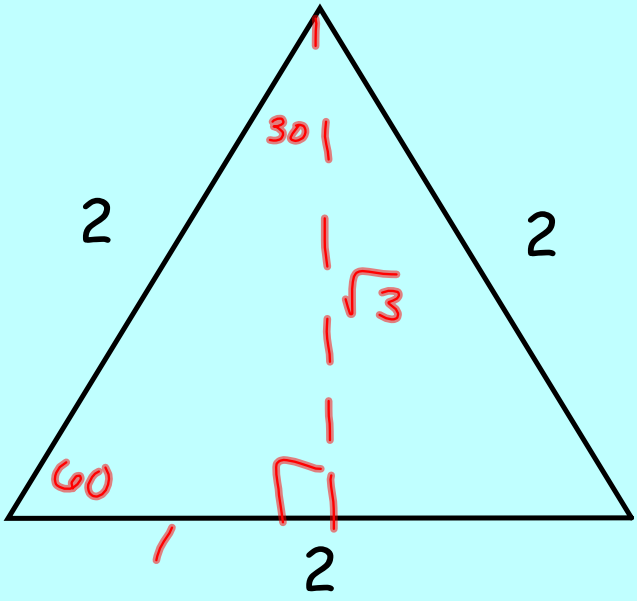
$\cos \frac{5\pi}{4} = \frac{-1}{\sqrt{2}}$

Ex.3

315*

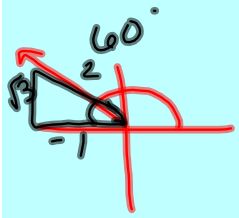


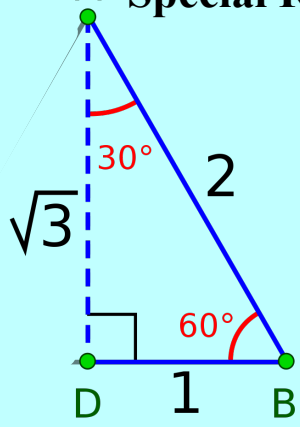
Find the altitude of an equilateral triangle whose sides have a length of two.

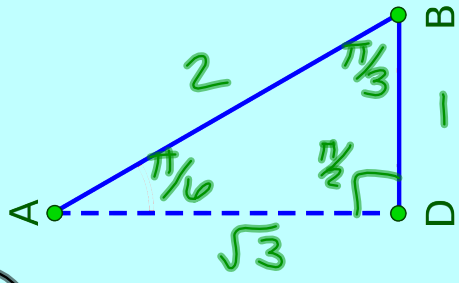


Special Right Triangles: 30 - 60 - 90

$\frac{\pi}{6} - \frac{\pi}{3} - \frac{\pi}{2}$







Ex.1

120*

$\cos 120 = \frac{-1}{2}$

$\tan 120 = \frac{-\sqrt{3}}{1} = -\sqrt{3}$

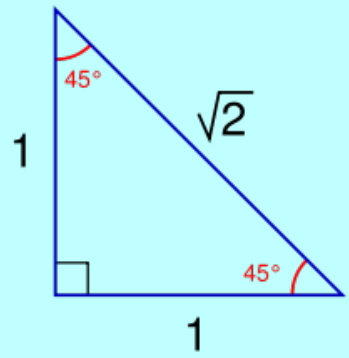
Ex.2

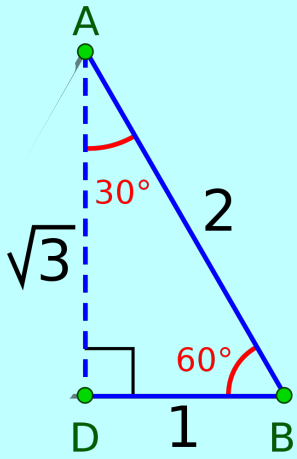
7π/6

$\sin \frac{7\pi}{6} = \frac{-1}{2} = \frac{-\sqrt{3}}{\sqrt{3}}$

Ex.3

330*





Practice 1

210*

Practice 2

$3\pi/4$

Homework Assignment:
page 411-413 (7-35 odd, 63, 64, 70)