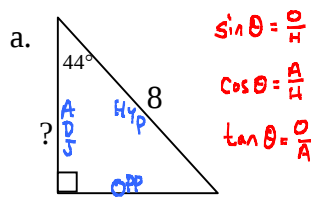


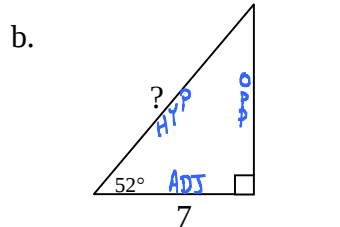
1. Find the requested unknown side of the following triangles.



STEP #1: LABEL
STEP #2: HAVE: H } USE
WANT: A } COSINE
STEP #3: $\cos 44^\circ \times \frac{A}{8}$
 $A = 8 \cos 44^\circ$

$8 * \cos(44)$
5.754718403

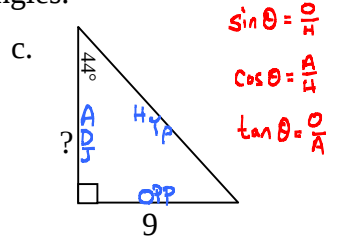
$A \approx 5.75$



STEP #1: LABEL
STEP #2: HAVE: A } USE
WANT: H } COSINE
STEP #3: $\cos 52^\circ \times \frac{H}{7}$
 $7 = H \cos 52^\circ$
 $H = \frac{7}{\cos 52^\circ}$

$7 / \cos(52)$
11.36988472

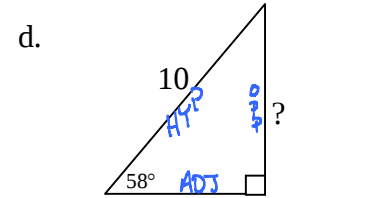
$H \approx 11.37$



STEP #1: LABEL
STEP #2: HAVE: OP } USE
WANT: A } TANGENT
STEP #3: $\tan 44^\circ \times \frac{9}{A}$
 $9 = A \tan 44^\circ$
 $A = \frac{9}{\tan 44^\circ}$

$9 / \tan(44)$
9.319772824

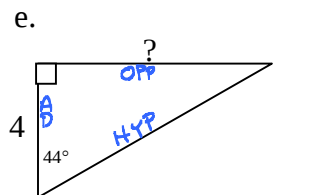
$A \approx 9.32$



STEP #1: LABEL
STEP #2: HAVE: H } USE
WANT: OP } SINE
STEP #3: $\sin 58^\circ \times \frac{10}{H}$
 $10 \sin 58^\circ = H$
 $H = 10 \sin 58^\circ$

$10 \sin(58)$
8.480480962

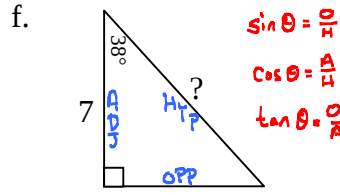
$OP \approx 8.48$



STEP #1: LABEL
STEP #2: HAVE: ADJ } USE
WANT: OPP } TANGENT
STEP #3: $\tan 44^\circ \times \frac{4}{x}$
 $x = 4 \tan 44^\circ$

$4 * \tan(44)$
3.862755099

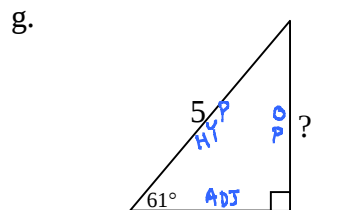
$OP \approx 3.86$



STEP #1: LABEL
STEP #2: HAVE: A } USE
WANT: H } COSINE
STEP #3: $\cos 38^\circ \times \frac{H}{7}$
 $7 = H \cos 38^\circ$
 $H = \frac{7}{\cos 38^\circ}$

$7 / \cos(38)$
8.883127506

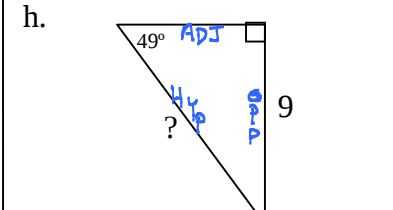
$H \approx 8.88$



STEP #1: LABEL
STEP #2: HAVE: H } USE
WANT: O } SINE
STEP #3: $\sin 61^\circ \times \frac{5}{H}$
 $5 \sin 61^\circ = H$
 $H = 5 \sin 61^\circ$

$5 * \sin(61)$
4.373098536

$OP \approx 4.37$



STEP #1: LABEL
STEP #2: HAVE: OP } USE
WANT: HT } SINE
STEP #3: $\sin 49^\circ \times \frac{9}{H}$
 $9 \sin 49^\circ = H$
 $H = 9 \sin 49^\circ$

$9 * \sin(49)$
11.92511694

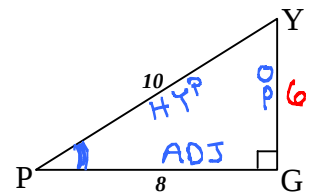
$H \approx 11.93$

2. Find the value of $\sin P$. $\sin P = \frac{OP}{HY} = \frac{6}{10}$

$\frac{6}{10} = \frac{3}{5}$

PYTHAGOREAN THEOREM
 $a^2 + b^2 = c^2$
 $8^2 + b^2 = 10^2$
 $64 + b^2 = 100$

$64 + b^2 = 100$
 -64
 $b^2 = 36$
 $b = 6$

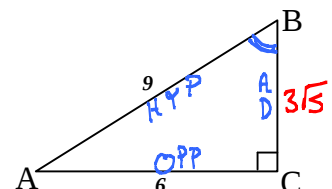


3. Find the EXACT value of $\tan B$.

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

PYTHAGOREAN THEOREM
 $a^2 + b^2 = c^2$
 $6^2 + b^2 = 9^2$
 $36 + b^2 = 81$

$36 + b^2 = 81$
 -36
 $b^2 = 45$
 $b = \sqrt{45} = \sqrt{9 \cdot 5} = 3\sqrt{5}$



4. Which expression represents $\cos(\theta)$ for the triangle shown?

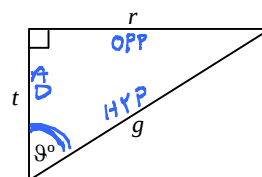
A. $\frac{g}{r}$

B. $\frac{r}{g}$

C. $\frac{g}{t}$

D. $\frac{t}{g}$

$\cos \theta = \frac{A}{H} = \frac{t}{g}$



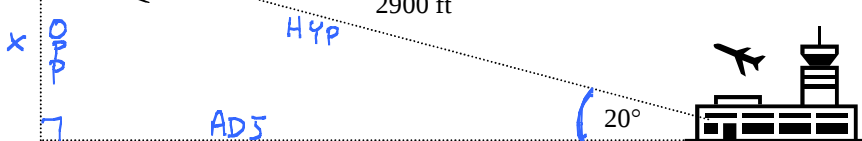
5. As a plane takes off it ascends at a 20° angle of elevation. If the plane has been traveling at an average rate of 290 ft/s and continues to ascend at the same angle, then how high is the plane after 10 seconds (the plane has traveled 2900 ft).

HAVE: H } USE
WANT: O } SINE

$\sin 20^\circ \times \frac{x}{2900}$

$\approx 992 \text{ ft}$

$x = 2900 \sin 20$
 $x \approx 992 \text{ ft}$



6. A person noted that the angle of elevation to the top of a silo was 65° at a distance of 9 feet from the silo. Using the diagram approximate the height of the silo.

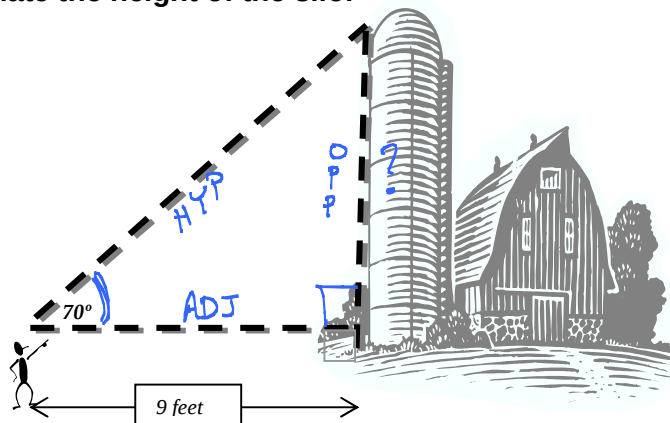
HAVE: A } USE
WANT: O } TANGENT

$\tan 70^\circ \times \frac{x}{9}$

$9 \cdot \tan(70)$
 24.72729678

$\approx 25 \text{ ft}$

$x = 9 \cdot \tan 70$
 $x \approx 24.7$



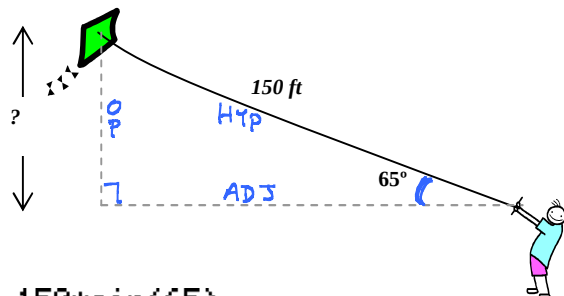
7. A kid is flying a kite and has reeled out his entire line of 150 ft of string. If the angle of elevation of the string is 65° then which expression gives the vertical height of the kite?

HAVE: H } USE
WANT: O } SINE

$\sin 65^\circ \times \frac{x}{150}$

$\approx 136 \text{ ft}$

$x = 150 \sin 65$
 $x \approx 135.9 \text{ ft}$



$150 \cdot \sin(65)$
 135.9461681

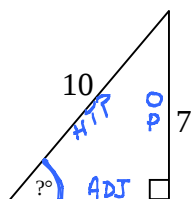
2. Find the requested unknown angles of the following triangles using a calculator.

a.

$$\sin \theta = \frac{O}{H}$$

$$\cos \theta = \frac{A}{H}$$

$$\tan \theta = \frac{O}{A}$$



STEP #1: LABEL

STEP #2: HAVE: OP } USE
HAVE: HYP } SINE

$$\text{STEP #3: } \sin \theta = \frac{7}{10}$$

$$\sin^{-1}(\sin \theta) = \sin^{-1}\left(\frac{7}{10}\right)$$

$$\theta = \sin^{-1}\left(\frac{7}{10}\right) \approx 44.4^\circ$$

$$\sin^{-1}(7/10)$$

$$= 44.427004$$

b.

$$\sin \theta = \frac{O}{H}$$

$$\cos \theta = \frac{A}{H}$$

$$\tan \theta = \frac{O}{A}$$



STEP #1: LABEL

STEP #2: HAVE: A } USE
HAVE: H } COSINE

$$\text{STEP #3: } \cos \theta = \frac{3}{9}$$

$$\cos^{-1}(\cos \theta) = \cos^{-1}\left(\frac{3}{9}\right)$$

$$\theta = \cos^{-1}\left(\frac{3}{9}\right) \approx 70.5^\circ$$

$$\cos^{-1}(3/9)$$

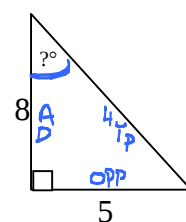
$$= 70.52877937$$

c.

$$\sin \theta = \frac{O}{H}$$

$$\cos \theta = \frac{A}{H}$$

$$\tan \theta = \frac{O}{A}$$



STEP #1: LABEL

STEP #2: HAVE: OP } USE
HAVE: AD } TANGENT

$$\text{STEP #3: } \tan \theta = \frac{8}{5}$$

$$\tan^{-1}(\tan \theta) = \tan^{-1}\left(\frac{8}{5}\right)$$

$$\theta = \tan^{-1}\left(\frac{8}{5}\right) \approx 32^\circ$$

$$\tan^{-1}(8/5)$$

$$= 32.00538321$$

2. Find the approximate unknown angle, θ , using INVERSE trigonometric ratios ($\sin^{-1}$, $\cos^{-1}$, or $\tan^{-1}$).

a. $\cos \theta = 0.823$

$$\cos^{-1}(\cos \theta) = \cos^{-1}(0.823)$$

$$\theta = \cos^{-1}(0.823)$$

$$\approx 34.6^\circ$$

$$\cos^{-1}(0.823)$$

$$= 34.61375727$$

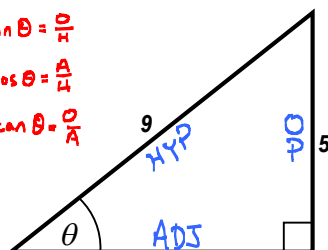
$$\theta = 34.6^\circ$$

b.

$$\sin \theta = \frac{O}{H}$$

$$\cos \theta = \frac{A}{H}$$

$$\tan \theta = \frac{O}{A}$$



STEP #1: LABEL

STEP #2: HAVE: OPP } USE
HAVE: HYP } SINE

$$\text{STEP #3: } \sin \theta = \frac{5}{9}$$

$$\sin^{-1}(\sin \theta) = \sin^{-1}\left(\frac{5}{9}\right)$$

$$\sin^{-1}(5/9)$$

$$= 33.7489886$$

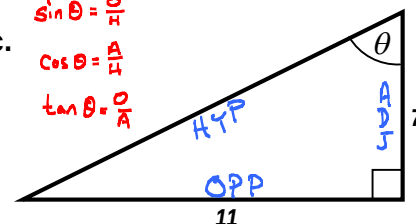
$$\theta = 33.7^\circ$$

c.

$$\sin \theta = \frac{O}{H}$$

$$\cos \theta = \frac{A}{H}$$

$$\tan \theta = \frac{O}{A}$$



STEP #1: LABEL

STEP #2: HAVE: OP } USE
HAVE: AD } TANGENT

$$\text{STEP #3: } \tan \theta = \frac{7}{11}$$

$$\tan^{-1}(\tan \theta) = \tan^{-1}\left(\frac{7}{11}\right)$$

$$\tan^{-1}(7/11)$$

$$= 57.52880771$$

$$\theta = 57.5^\circ$$

3. Identify each of the following requested Trig Ratios.

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

B. $\cos B = \frac{\text{ADJ}}{\text{HYP}} = \frac{15}{17}$

C. Measure of angle B = 28.1°

$$\cos B = \frac{15}{17}$$

$$\cos^{-1}(\cos B) = \cos^{-1}\left(\frac{15}{17}\right)$$

$$B \approx 28.1^\circ$$

$$\cos^{-1}(15/17)$$

$$= 28.07248694$$

