PreCalculus   Name __Key__
Solving Right Triangles WS

Solve each of the following triangles. (That means find the measure of each missing side and angle.)
You MUST draw a triangle for each problem and you MUST show the equation you are using to find each part. Round your answers to the nearest hundredth unless an angle is given in DMS format; if that is the case, write your answers for the angles in DMS format.

1. Triangle ABC -- given that angle B is the right angle, side b = 5, side c = 4.

$\boxed{a=3}$ $\tan C = \frac{4}{3}$

$C = \tan^{-1}\left(\frac{4}{3}\right)$

$\boxed{C = 53.13°}$
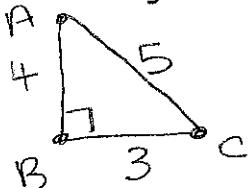
$A = 90° - 53.13°$
$\boxed{A = 36.87°}$

2. Triangle DEF -- given that angle F is the right angle, side d = 4.4, side f = 11
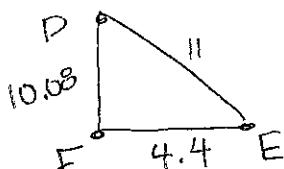
$e^2 + 4.4^2 = 11^2$ $\cos E = \frac{4.4}{11}$ $90° - 66.42°$

$e^2 + 19.36 = 121$

$e^2 = 101.64$ $E = \cos^{-1}\left(\frac{4.4}{11}\right)$ $\boxed{D = 25.38°}$

$\boxed{e = 10.08}$ $\boxed{E = 66.42°}$

3. Triangle PQR – given that angle P = 32°, angle Q = 90°, side r = 13.93

$90° - 32°$ $\tan 32° = \frac{P}{13.93}$ $\cos 32° = \frac{13.93}{q}$

$\boxed{R = 58°}$ $q \cos 32° = 13.93$

$P = 13.93 \tan 32$ $q = \frac{13.93}{\cos 32}$

$\boxed{P = 8.7}$
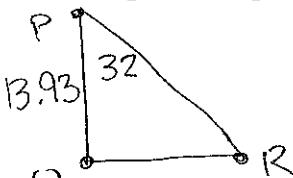
$\boxed{q = 16.43}$

4. Triangle DEF – given that side e = 3.2, angle E is the right angle, angle D = 47° 18'

$\sin 47°18' = \frac{d}{3.2}$ $\cos 47°18' = \frac{f}{3.2}$

$\boxed{d = 2.35}$ $\boxed{f = 2.17}$
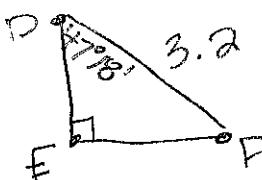
$90° - 47°18'$
42.7×60

$\boxed{F = 42°42'}$

5. Triangle CAT – given that angle A = 90°, side t = 5.82, angle C = 50.1°
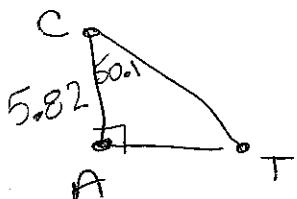
$90° - 50.1°$ $\cos 50.1° = \frac{5.82}{a}$ $\tan 50.1 = \frac{c}{5.82}$

$\boxed{T = 39.9°}$ $a \cos 50.1° = 5.82$

$a = \frac{5.82}{\cos 50.1}$ $\boxed{a = 9.07}$ $\boxed{c = 6.96}$

6. Triangle MAT – given that side m = 8, a = 15, t = 17 ← pythagorean triple; t = hypotenuse

$\boxed{T = 90°}$
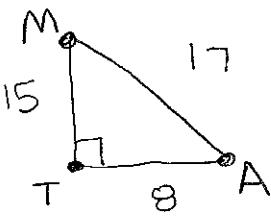
$\sin A = \frac{15}{17}$

Angle M =
$90° - 61.93$ $\boxed{= 28.07°}$

$A = \sin^{-1}\left(\frac{15}{17}\right)$

$\boxed{A = 61.93°}$

ANSWERS:
1. Angle A = 36.87° Angle C = 53.13° side a = 3   2. Angle D = 23.58° Angle E = 66.42° side e = 10.08
3. Angle R = 58° side p = 8.70 side q = 16.43   4. Angle F = 42°42' side f = 2.17 side d = 2.35
5. Angle T = 39.9° side a = 9.07 side c = 6.96   6. Angle M = 28.07°, A = 61.93°, T = 90°