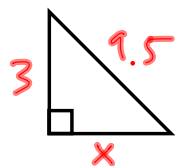1. Given a right triangle with a leg of 3 and hypotenuse of 9.5, find the perimeter of the triangle. Round your answer to the nearest hundredth.
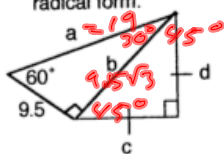
$$3^2 + x^2 = 9.5^2$$
$$9 + x^2 = 90.25$$
$$\sqrt{x^2} = \sqrt{81.25}$$
$$x \approx 9.01387$$
$$P = 3 + 9.5 + 9.01387 = \boxed{21.51}$$

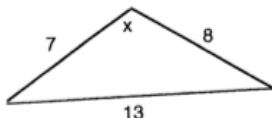2. Find a, b, c, and d. Leave all answers in simplified radical form.

$$a = 9.5 * 2$$
$$\boxed{a = 19}$$
$$\boxed{b = 9.5\sqrt{3}}$$

$$c = \frac{9.5\sqrt{3}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$$
$$\boxed{c = \frac{9.5\sqrt{6}}{2}}$$
$$\boxed{d = \frac{9.5\sqrt{6}}{2}}$$

3. Find x to the nearest tenth of a degree.

7   x   8

13

$13^2 = 7^2 + 8^2 - 2(7)(8)\cos X$

$169 = 113 - 112\cos X$

$\underline{-113 \quad -113}$

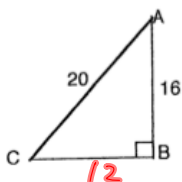$\dfrac{56}{-112} = \dfrac{-112\cos X}{-112}$

$\cos X = \dfrac{56}{-112}$

$X = 120°$

$X \approx \cos^{-1}\left(\dfrac{56}{-112}\right)$

4. Give the trigonometric ratio in fraction form and rounded to to the nearest ten-thousandth.

a. tan A

b. cos C

A
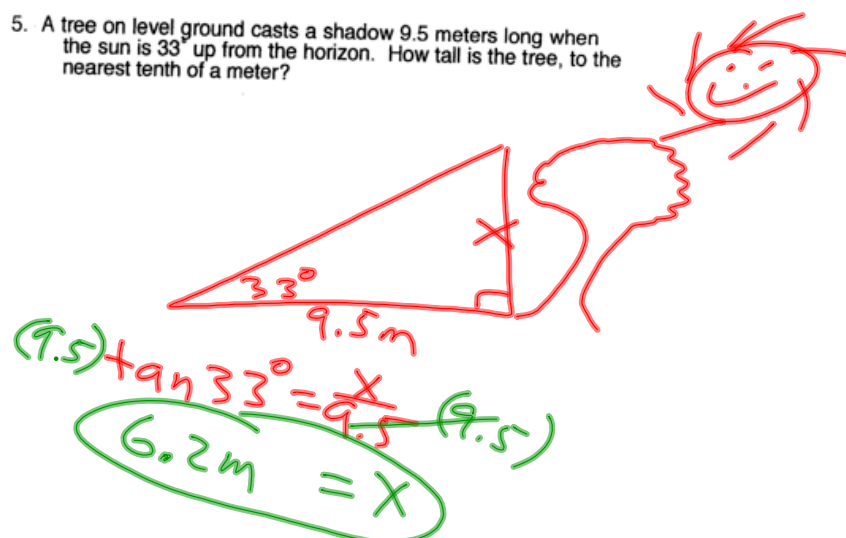20   16
C   12   B

$16^2 + a^2 = 20^2$

$256 + a^2 = 400$

$\sqrt{a^2} = \sqrt{144}$

$a = 12$

A.) $\tan A = \dfrac{12}{16} = 0.75$

B.) $\cos C = \dfrac{12}{20} = 0.6$

5. A tree on level ground casts a shadow 9.5 meters long when the sun is 33° up from the horizon. How tall is the tree, to the nearest tenth of a meter?

$(9.5)\tan 33° = \dfrac{x}{9.5}(9.5)$

$6.2m = x$

6. Solve $\triangle STU$. Round measures to the nearest tenth.
   $m\angle T = 87°$, $s = 4.5$, $t = 6.2$

① $\dfrac{\sin 87°}{6.2} \times \dfrac{\sin S}{4.5}$

$\dfrac{4.5 \sin 87°}{6.2} = \dfrac{6.2 \sin S}{6.2}$

$0.7248811 = \sin S$

$\sin^{-1} 0.7248811 = S$

$46.4° \approx S$

② $\angle u = 180 - (87 + 46.4)$

$\angle u = 46.6°$

③ $\dfrac{\sin 46.6°}{u} \times \dfrac{\sin 87°}{6.2}$

$\dfrac{u \sin 87°}{\sin 87°} = \dfrac{6.2 \sin 46.6}{\sin 87°}$

$u \approx 4.5$

$S = 46.4°$
$U = 46.6°$
$u = 4.5$

8. Could 9, 6, and $\sqrt{116}$ be a right triangle? Explain your answer.
    Could they be a Pythagorean Triple? Why or why not.

10.7

no

$$9^2 + 6^2 = \left(\sqrt{116}\right)^2$$

$$81 + 36 = 116$$

$$117 \neq 116$$

no, not a right △