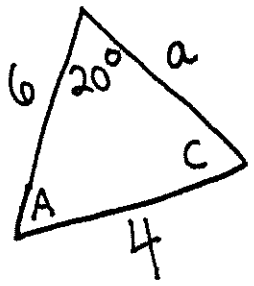
Quiz 15 Solution

(1)



Find C

$$\frac{\sin 20^\circ}{4} = \frac{\sin C}{6}$$

$$\downarrow$$

$$\underbrace{\frac{6\sin 20^\circ}{4}}_{=0.513} = \sin C$$

$$C = \sin^{-1}(0.513) = 30.86^\circ$$

Find A

$$30.86^\circ + A + 20^\circ = 180^\circ$$

$$A = 129.14^\circ$$

Find a

$$\frac{\sin 20^\circ}{4} = \frac{\sin(129.14^\circ)}{a}$$

$$\downarrow$$

$$a = \frac{4\sin(129.14^\circ)}{\sin(20^\circ)} = 9.07$$

Check for second possible solution:

$$C_2 = 180^\circ - 30.86^\circ = 149.14^\circ$$

$\uparrow$

NOT too big

$\downarrow$

2 solutions

$\Downarrow$

Find A

$$149.14^\circ + A + 20^\circ = 180^\circ$$

$$\downarrow$$

$$A = 10.86^\circ$$

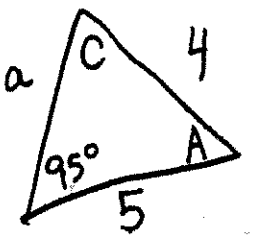
Find a

$$\frac{\sin 20^\circ}{4} = \frac{\sin(10.86^\circ)}{a}$$

$$\downarrow$$

$$a = \frac{4\sin(10.86^\circ)}{\sin(20^\circ)} = 2.2035$$

(2)



Find C

$$\frac{\sin 95^\circ}{4} = \frac{\sin C}{5}$$

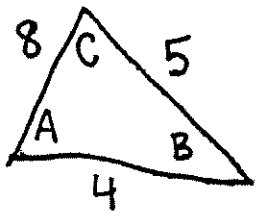
$$\sin C = \frac{5\sin 95^\circ}{4} = 1.245$$

$$C = \sin^{-1}(1.245) = \text{ERROR}$$

This triangle has no solution.

---

(3)



Find A

$$5^2 = 8^2 + 4^2 - 2(8)(4)\cos(A)$$

$$25 = 64 + 16 - 64\cos(A)$$

$$-55 = -64\cos(A)$$

$$0.8593 = \cos A$$

$$A = \cos^{-1}(0.8593) = 30.76^\circ$$

Find B

$$8^2 = 4^2 + 5^2 - 2(4)(5)\cos(B)$$

$$64 = 16 + 25 - 40\cos(B)$$

$$23 = -40\cos(B)$$

$$-0.575 = \cos(B)$$

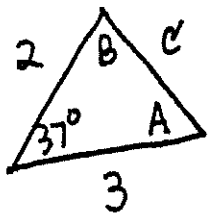
$$B = \cos^{-1}(-0.575) = 125.1^\circ$$

Find C

$$30.76^\circ + 125.1^\circ + C = 180^\circ$$

$$C = 24.14^\circ$$

(4)



Find C

$c^2 = 2^2 + 3^2 - 2(2)(3)\cos(37^\circ)$

$= 3.416$

$\downarrow$

$c = \sqrt{3.416} = 1.84824$

Find B

$3^2 = 2^2 + (1.84824)^2 - 2(2)(1.84824)\cos(B)$

$9 = 4 + 3.4159 - 7.3929\cos(B)$

$\downarrow$

$-0.2142 = \cos B$

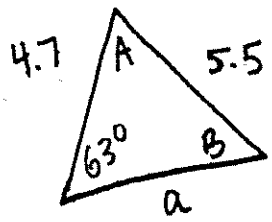
$B = \cos^{-1}(-0.2142) = 102.4^\circ$

Find A

$37^\circ + 102.4^\circ + A = 180^\circ$

$A = 40.6^\circ$

(5)



Find B

$$\frac{\sin 63^\circ}{5.5} = \frac{\sin B}{4.7}$$

$$\sin B = \frac{4.7\sin(63^\circ)}{5.5} = 0.7614$$

$$B = \sin^{-1}(0.7614) = 49.59^\circ$$

Other poss angle

$$B_2 = 180^\circ - 49.59^\circ$$

$$= 130.41$$

TOO BIG!!

Find A

$$63^\circ + 49.59^\circ + A = 180^\circ$$

$$A = 67.41^\circ$$

Find a

$$\frac{\sin(67.41^\circ)}{a} = \frac{\sin(63^\circ)}{5.5}$$

$$a = \frac{5.5\sin(67.41^\circ)}{\sin(63^\circ)} = 5.699$$