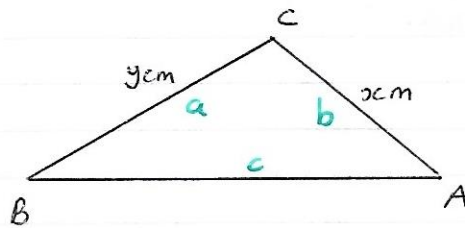


Triangle Trig 3: Answers

67)



$$\sin A = \frac{3}{5} \quad \sin B = \frac{5}{13}$$

$$\sin C = \frac{56}{65}$$

$$a) \frac{a}{\sin A} = \frac{b}{\sin B}$$

$$\frac{y}{3/5} = \frac{x}{5/13}$$

$$\frac{5y}{3} = \frac{13x}{5}$$

$$y = \frac{39x}{25}$$

$$y = 1.56x$$

$$b) A = \frac{1}{2} ab \sin C$$

$$4 \cdot 2 = \frac{1}{2} (1.56x)(x) \frac{56}{65}$$

$$\frac{4 \cdot 2 \times 2 \times 65}{1.56 \times 56} = x^2$$

$$\frac{25}{4} = x^2$$

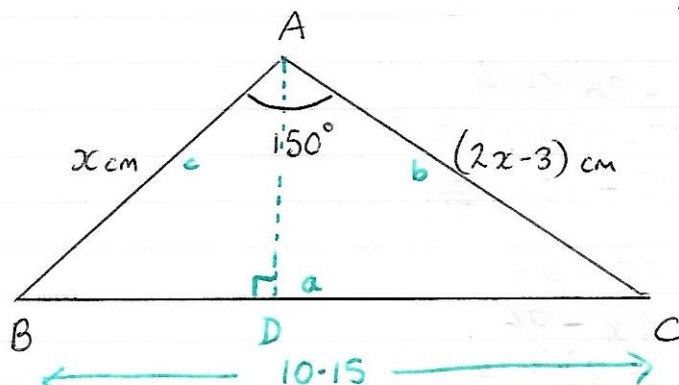
$$\pm \frac{5}{2} = x$$

$$\therefore x = 2.5 \text{ cm}$$

$$\therefore y = 1.56 \times 2.5$$

$$y = 3.9 \text{ cm}$$

68)



$$\text{Area} = 6.75 \text{ cm}^2$$

$$a) \text{Area} = \frac{1}{2} bc \sin A$$

$$\text{Area} = \frac{1}{2} bc \sin A$$

$$6.75 = \frac{1}{2} (2x-3)(x) \sin 150^\circ$$

$$27 = (2x-3)x$$

$$27 = 2x^2 - 3x$$

$$0 = 2x^2 - 3x - 27$$

$$0 = (2x-9)(x+3)$$

either

$$2x-9=0$$

$$x = 9/2 \text{ cm}$$

$$x = 4.5 \text{ cm}$$

$$\text{or } x = -3$$

IMPOSSIBLE

b)

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$BC^2 = 6^2 + 4.5^2 - 2(6)(4.5) \cos 150^\circ$$

$$BC^2 = 36 + 20.25 + 46.77$$

$$BC^2 = 103.01$$

$$BC = 10.15 \text{ cm}$$

$$2x - 3 = 6 \text{ cm}$$

$$2x = 4.5 \text{ cm}$$

c) Area of $\triangle = \frac{bh}{2}$

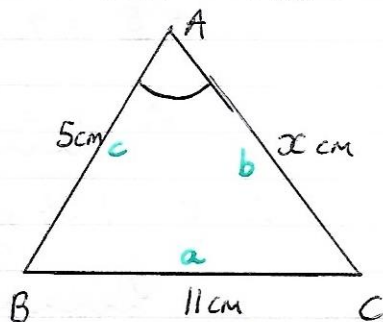
$$6.75 = \frac{BC \times ht.}{2}$$

$$13.5 = 10.15 \times ht$$

$$\frac{13.5}{10.15} = AD$$

$$1.33 \text{ cm} = AD$$

69)



$$\cos \hat{BAC} = \frac{2}{5}$$

a)

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$11^2 = x^2 + 5^2 - 2(x)(5) \cos A$$

$$121 = x^2 + 25 - 10x \left(\frac{2}{5}\right)$$

$$121 = x^2 + 25 - 4x$$

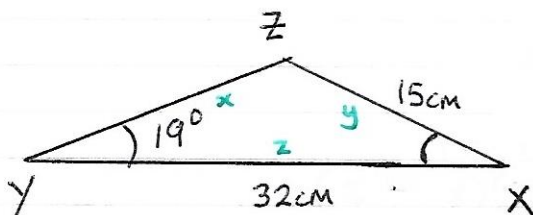
$$0 = x^2 - 4x - 96$$

$$0 = (x - 12)(x + 8)$$

either $x = 12 \text{ cm}$ or $x = -8$

IMPOSSIBLE

b)



$$\frac{15}{\sin 19^\circ} = \frac{32}{\sin Z}$$

$$\sin Z = \frac{32 \sin 19^\circ}{15}$$

$$\sin Z = 0.707$$

$$Z = 45^\circ$$

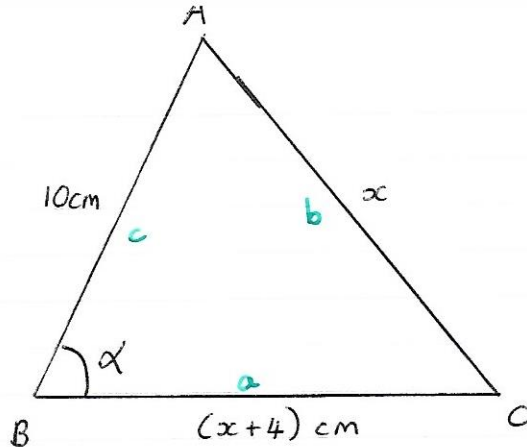
Sin +ve 1st + 2nd

$$Z = 45^\circ \text{ or } 135^\circ$$

$\therefore \hat{YXZ} = 180 - 19 - 45 = 116^\circ$

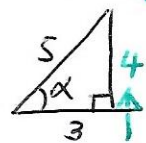
OR $\hat{YXZ} = 180 - 19 - 135 = 26^\circ$

70)



$$\cos \alpha = \frac{3}{5}$$

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



from Pythag

$$\begin{aligned} a) \quad b^2 &= a^2 + c^2 - 2ac \cos B \\ x^2 &= (x+4)^2 + 10^2 - 2(x+4)(10) \frac{3}{5} \end{aligned}$$

$$x^2 = x^2 + 8x + 16 + 100 - 12(x+4)$$

$$x^2 = x^2 + 8x + 16 + 100 - 12x - 48$$

$$4x = 68$$

$$x = 17 \text{ cm}$$

$$\therefore x+4 = 21 \text{ cm}$$

$$b) \quad \text{Area} = \frac{1}{2} ac \sin B$$

$$= \frac{1}{2} (21)(10) \frac{4}{5} \quad \leftarrow \text{FROM GREEN ABOVE}$$

$$= 84 \text{ cm}^2$$