

Terrific work, Rachel! Just a few to check.

Regards, Kris.

Q1)

a) $226 - 34 = 192 \text{ beats/min}$ ✓

b) $55/100 \times 192 = 105.6 \text{ beats/min}$ ✓

c) MHR for males $= 220 - \text{age}$

Age $= 220 - \text{MHR}$ ✓

Age $= 220 - 177$ ✓
 $= 43 \text{ years}$

d) 1 min $= 132 \text{ beats}$

25 min workout $= 132 \times 25$ ✓

$= 3300 \text{ times}$ ✓

Q2) $100 \text{ W} \times 4 \text{ hours} \times 7 \text{ days}$
 $= 2800 \text{ W}$ ✓

$1 \text{ kW} = 1000 \text{ W}$

~~2800 W~~ $\rightarrow$ ~~2.8 kWh~~



$2800 \text{ W} = 2.8 \text{ kWh}$ ✓

(2)

Q3)

$$a) 2156 \text{ kWh} \div 92 = 23.43478261 \\ = 23.43 \text{ kWh} \checkmark$$

b) Off-peak rate of electricity refers to electricity used during the late evening and early morning when demand from households and businesses is lower. During this time, electricity is charged at a cheaper rate. ✓

$$c) \text{ Total} = 2156 \text{ kWh}$$

$$\text{Domestic} = 957 \text{ kWh}$$

$$\text{Off-peak} = 1199 \text{ kWh} (2156 - 957)$$

$$\text{Domestic} = 0.583 \times 957 \\ = \$557.93 \checkmark$$

$$\text{Off-peak} = 0.159 \times 1199 \\ = \$190.64 \checkmark$$

$$\$557.93 + \$190.64 \\ = \$748.57 \checkmark$$

$$Q4) 2400 \text{ W} \times 6 \text{ hrs} = 14,400 \text{ W}$$

$$1 \text{ kWh} = 1000 \text{ Wh} \checkmark$$

$$14400 \div 1000 = 14.4 \text{ kWh}$$

$$14.4 \times 0.25 \checkmark \\ = \$3.60$$

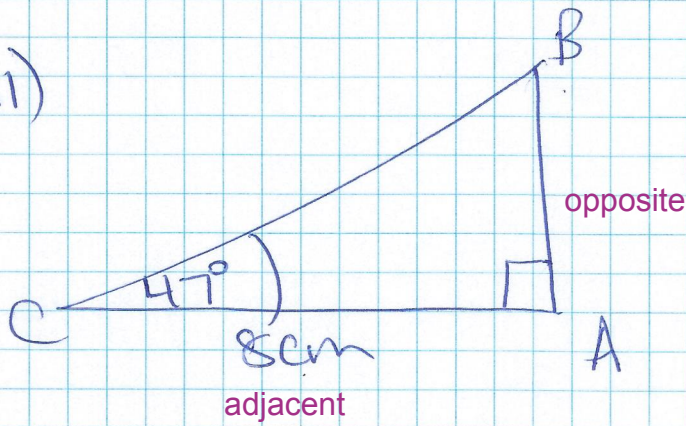
4

2

Section B

3

Q1)



$$\tan 47^\circ = \frac{8^{\text{opp}}}{AB^{\text{adj}}}$$

swap

$$AB = \frac{8}{\tan 47^\circ}$$

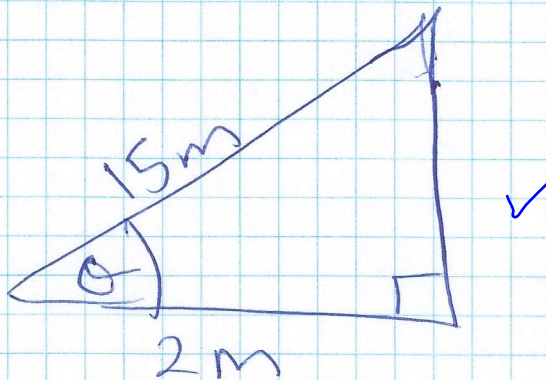
$$AB = 8 \times \tan 47 = 8.5789..$$
$$= 8.6 \text{ cm}$$

$$= 7.460120689$$

$$\therefore AB = 7.5 \text{ cm} \quad \times$$

Q2)

a)



$$b) \cos \theta = \frac{2}{15} \quad \checkmark$$

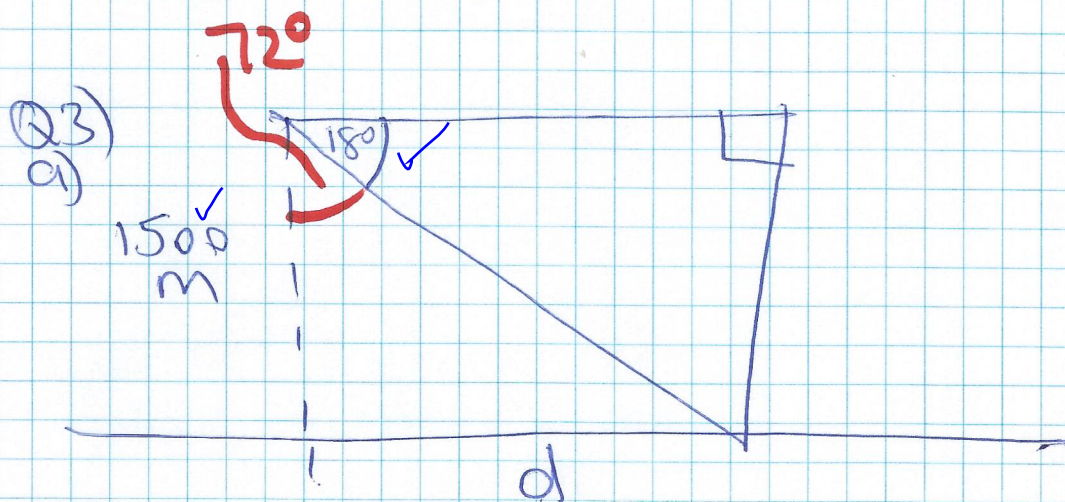
$$\theta = 82.33774434$$
$$= 82^\circ 20' 15.88''$$

$$\therefore \theta = 82^\circ \quad \checkmark$$

$\frac{1}{2}$

3

(4)



b) $90^\circ - 18^\circ = 72^\circ$ ✓

$$\tan 72^\circ = \frac{d}{1500}$$
 ✓

3

$$d = 1500 \times \tan 72^\circ$$

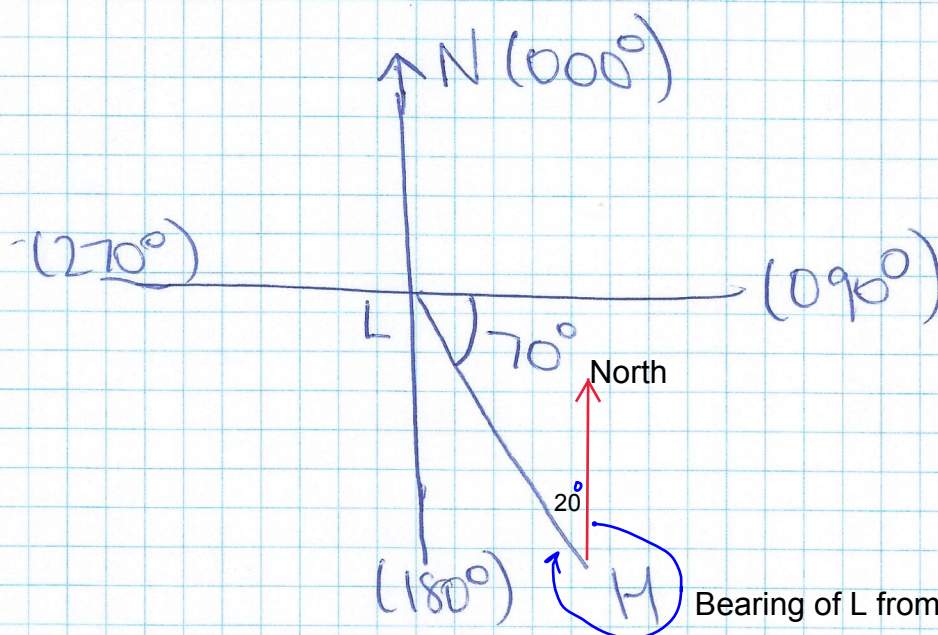
$$= 4616.525306 \text{ m}$$
 ✓

Excellent setting out!

to get km divide by 1000

$$\therefore d = 4.6 \text{ km}$$
 ✓

Q4)

 $\frac{1}{2}$

a) $E \text{ to } H = 90 + 70$
 $= 160^\circ$ ✓

b) $160^\circ + 20^\circ = 180^\circ$ ✗

Bearing of L from H is $360 - 20 = 340^\circ$

5

Q5) $c^2 = a^2 + b^2 - 2ab \cos C$

$$c^2 = 13^2 + 5^2 - 2 \times 13 \times 5 \times \cos 135^\circ \quad \checkmark$$

$$c^2 = 194 - -91.92388155$$

$$c^2 = 285.9238816 \quad \checkmark$$

$$c = \sqrt{285.9238816}$$

$$c = 16.90928389 \quad \checkmark$$

$$\therefore c = 17 \text{ km} \quad \checkmark$$

Q6)
$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

$$\cos C = \frac{10.5^2 + 15.6^2 - 12.8^2}{2 \times 10.5 \times 15.6} \quad \text{swap}$$

Rachel, this is angle
BCA, not angle ABC

$$2 \times 10.5 \times 15.6 \quad \times \quad 12.8$$

$$\cos C = \frac{189.77}{327.6}$$

$$\cos C = 54.60053899$$

$$\therefore \angle \overset{\text{BCA}}{\cancel{ABC}} = 54^\circ 36'$$

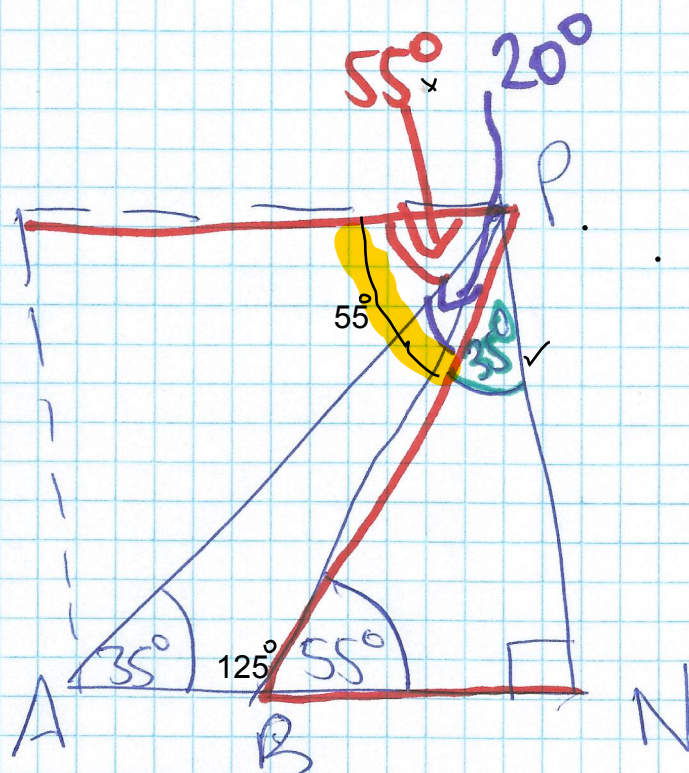
$$\text{Angle ABC} = 83^\circ 26'$$

$$2\frac{1}{2}$$

(6)

Q7)

a)



$$180 - 55 = 125^\circ$$

$$\text{angle APB} = 180 - (125 + 35) = 20^\circ$$

$$\begin{aligned}\triangle BPN &= 90 + 55 \\ &= 145\end{aligned}$$

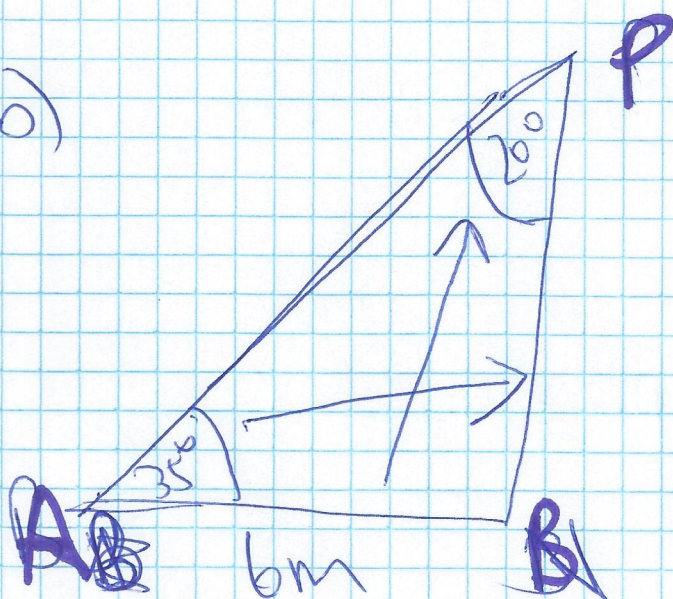
55° and 20° are marked incorrectly on your diagram above.

$$180 - 145 = 35^\circ$$

$$55^\circ - 35^\circ = 20^\circ \quad \times$$

$$\therefore \angle APB = 20^\circ$$

b)



$$\frac{PB}{\sin 35^\circ} = \frac{6}{\sin 20^\circ}$$

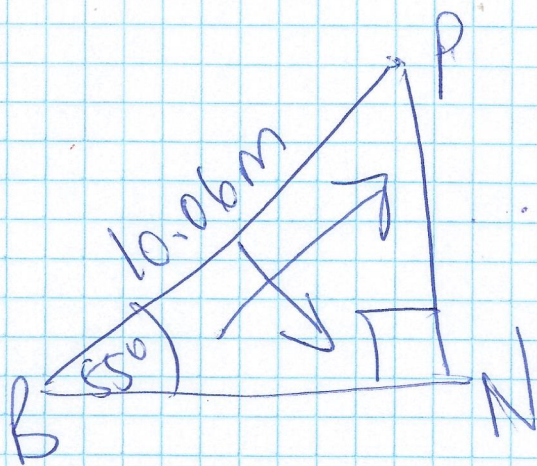
$$PB = \frac{6 \sin 35^\circ}{\sin 20^\circ}$$

Good!

$$PB = 10.06 \text{ m}$$

7

Q7)
c)



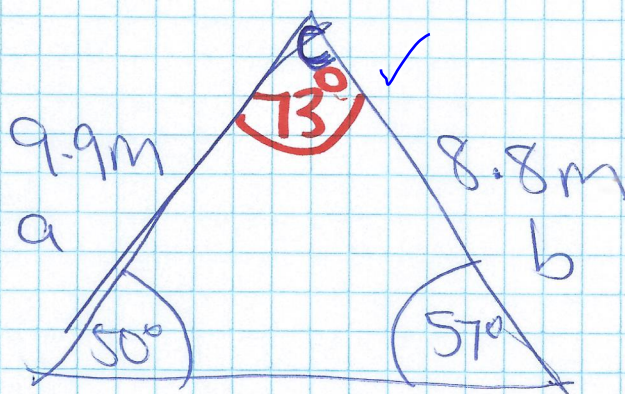
$$\frac{PN}{\sin 55^\circ} = \frac{10.06}{\sin 90^\circ}$$

$$PN = \frac{10.06 \sin 55^\circ}{\sin 90^\circ}$$

$$PN = 8.24m$$

4
5

Q8)



$$\begin{aligned} \text{Triangle} &= 180^\circ \\ 180 - 57 - 50 &= 73^\circ \end{aligned}$$

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

$$A = \frac{1}{2} \times 9.9 \times 8.8 \times \sin 73^\circ$$

$$A = 41.65663517$$

$$\therefore A = 42m^2$$

2

(8)

Q9) $\frac{105}{\sin \theta} = \frac{120}{\sin 83^\circ}$ ✓

$$\frac{\sin \theta}{105} = \frac{\sin 83^\circ}{120} \quad \checkmark$$

$$\sin \theta = \frac{105 \sin 83^\circ}{120}$$

2

$$\begin{aligned} \theta &= 60.28223856 \\ &= 60^\circ 16' 56.06'' \end{aligned}$$

Great!

$$\therefore \theta = 60^\circ \quad \checkmark$$