Section A

Q1)

a) 226-34 = 192 beats/min

b) 55/100 x 192 = 105.6 beats/min

c) MHR for males = 220 - age

Age = 220 - MHR

Age = 220 - 177

= 43 years

d) 1 min = 132 beats

25 min workout = 132 x 25

= 3300 times

Q2) 100W x 4 hours x 7 days

= 2800 W

1 KW = 1000 W

~~2800 KW~~ ~~2.8 KWH~~

2800W = 2.8 kWh

Q3)

a) 2156 kWh ÷ 92 = 23.434782 61
= 23.43 kWh

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) Total = 2156 kWh
Domestic = 957 kWh
Off-peak = 1199 kWh (2156 - 957)

Domestic = 0.583 × 957
= $557.93

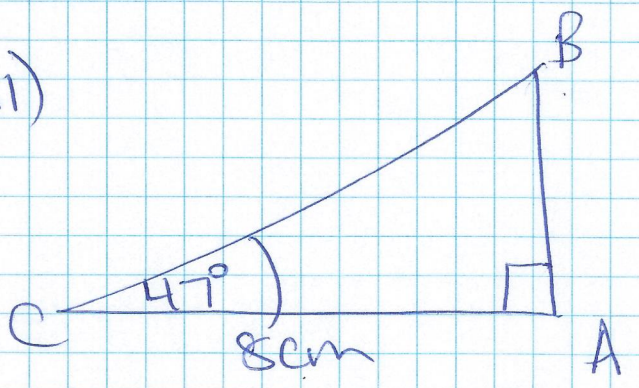
Off-peak = 0.159 × 1199
= $190.64

$557.93 + $190.64
= $748.57

Q4) 2400 w × 6 hrs = 14,400 w
1 kWh = 1000 wh
14400 ÷ 1000 = 14.4 kWh
14.4 × 0.25
= $3.60

Section B

Q1)



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

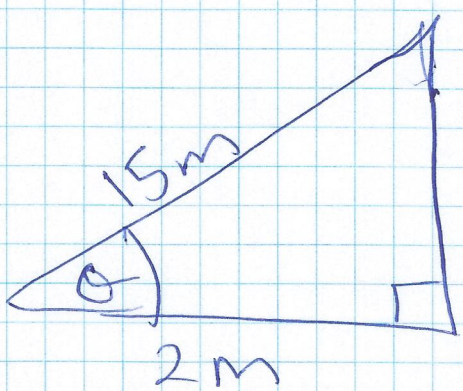
$$AB = \frac{8}{\tan 47^\circ}$$

$$= 7.460120689$$

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

Q2)

a)



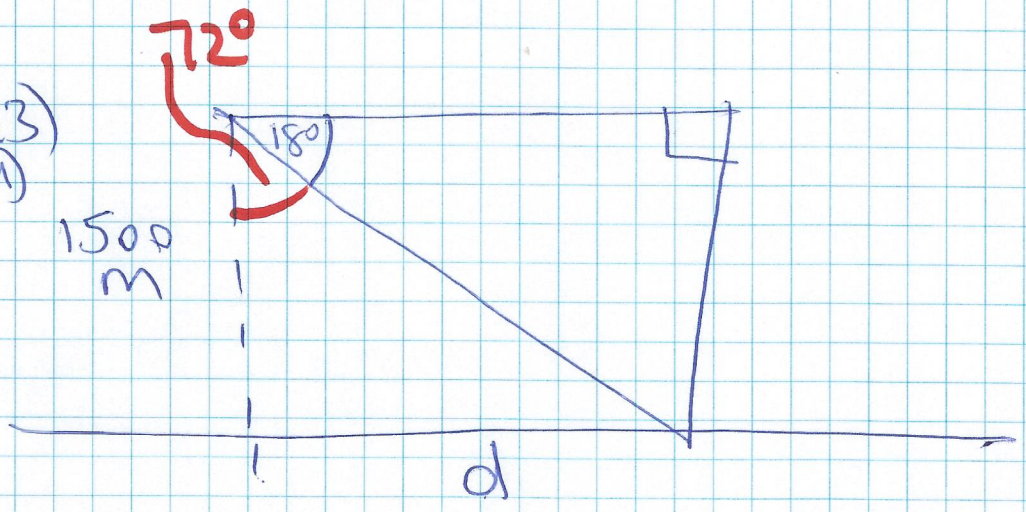
b) $\cos\theta = \frac{2}{15}$

$$\theta = 82.33774434$$

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

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

Q3)
a)



b) $90° - 18° = 72°$

$$\tan 72° = \frac{d}{1500}$$

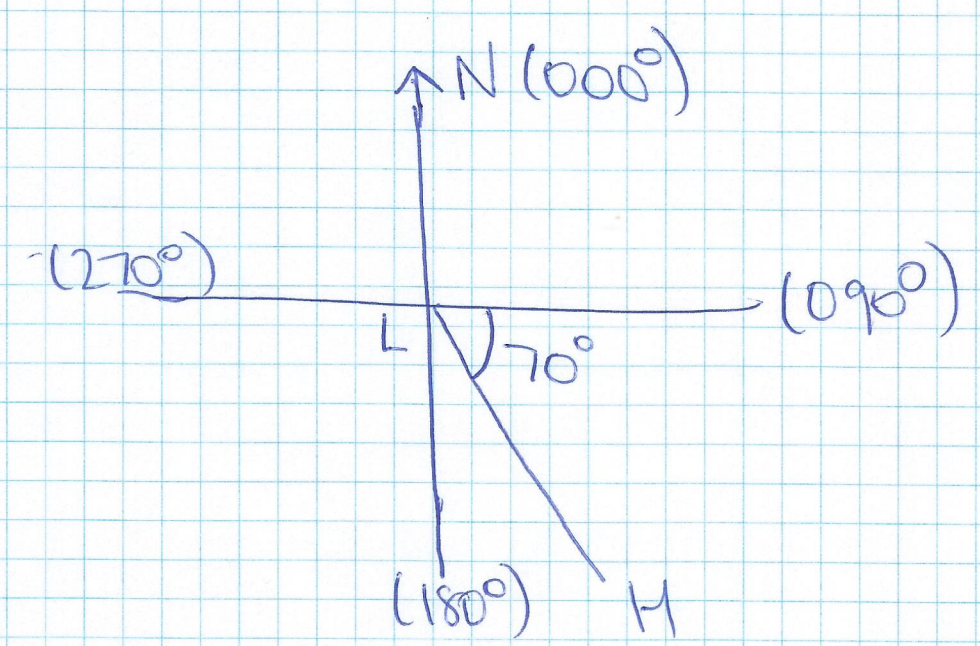
$d = 1500 \times \tan 72°$

$= 4616.525306\,m$

to get km divide by 1000

$\therefore d = 4.6\,km$

Q4)



a) E to H $= 90 + 70$

$= 160°$

b) $160° + 20° = 180°$

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

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

$c^2 = 194 - -91.92388155$

$c^2 = 285.92388816$

$c = \sqrt{285.92388816}$

$c = 16.90928389$

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

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

$\cos C = \dfrac{10.5^2 + 15.6^2 - 12.8^2}{2 \times 10.5 \times 15.6}$

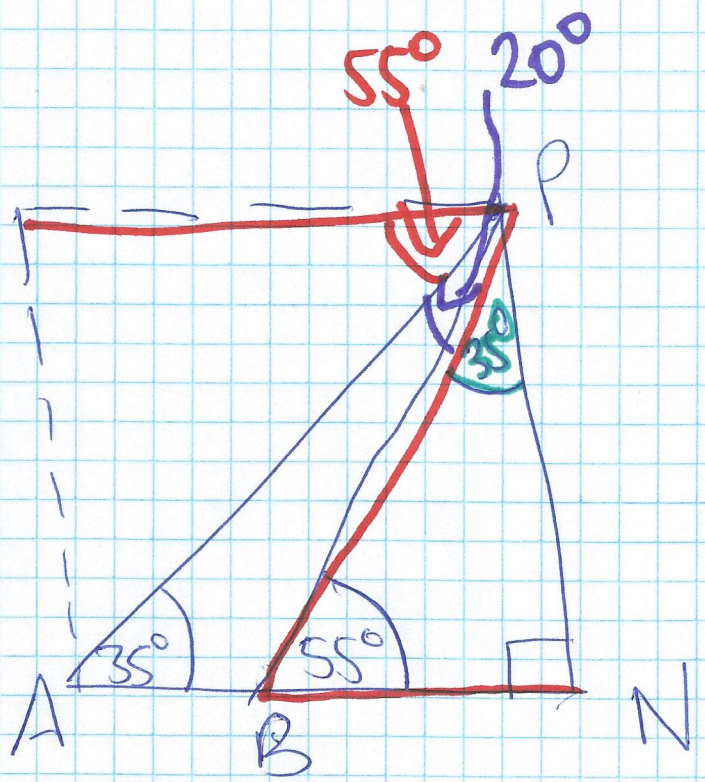
$\cos C = \dfrac{189.77}{327.6}$

$\cos C = 54.60053899$

$\therefore \angle ABC = 54^\circ 36'$

Q7)

a)



$\Delta BPN = 90 + 55$

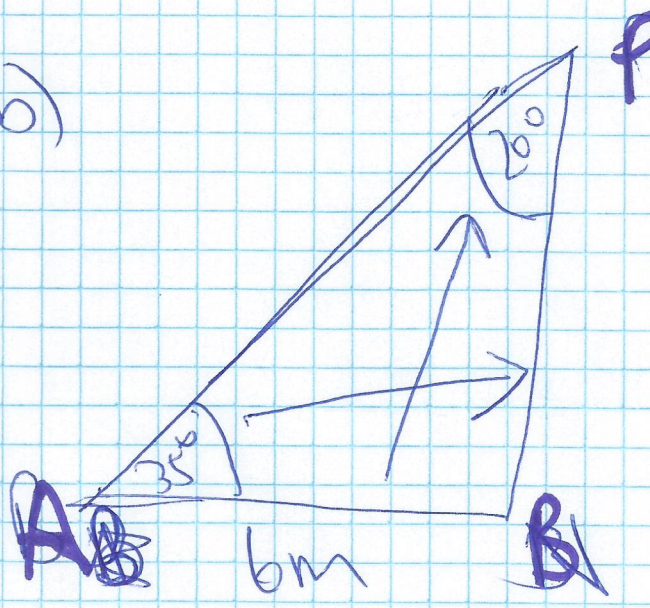
$= 145$

$180 - 145 = 35°$

$55° - 35° = 20°$

$\therefore \angle APB = 20°$

b)

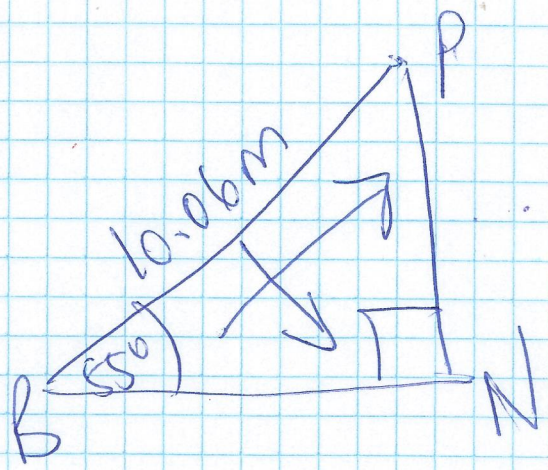


$$\frac{PB}{\sin 35°} = \frac{6}{\sin 20°}$$

$$PB = \frac{6 \sin 35°}{\sin 20°}$$

$PB = 10.06m$

Q7)
c)

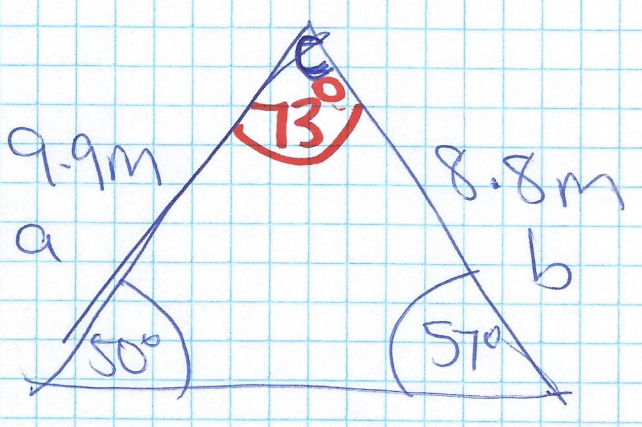


$$\frac{PN}{\sin 55^\circ} = \frac{10.06}{\sin 90^\circ}$$

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

$$PN = 8.24m$$

Q8)



Triangle $= 180^\circ$

$180 - 57 - 50 = 73^\circ$

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

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

$$A = 41.65663517$$

$\therefore A = 42m^2$

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

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

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

$\theta = 60.28223856$

$= 60^\circ 16' 56.06''$

$\therefore \theta = 60^\circ$