CREDIT 2008 PAPER 2 SOLUTIONS

1. $42\,000 \times 1.08^3 = 52907.9$

$\Rightarrow$ 52900 tonnes

2 (a) Median = 34

Mode = 29

(b) $P(x \geq 40) = \frac{11}{30}$

3. 80% = 45

10% = $\frac{45}{8}$

= 5.625

100% = 56.25

Original price was £56.25

4 (a) $x + y = 60$ ①

(b) $50x + 20y = 1740$ ②

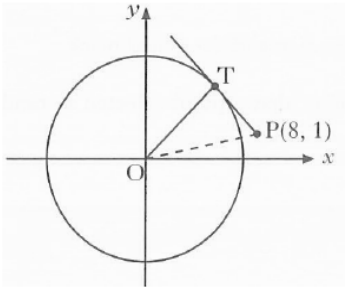
(c) $20x + 20y = 1200$ ③

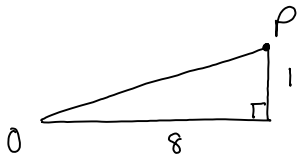
$30x = 540$ ② − ③

$x = 18$

Aaron has 18 fifty pence coins

5. (a)





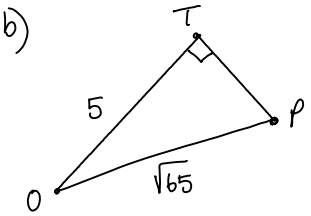
$OP^2 = (8)^2 + (1)^2$

$OP^2 = 64 + 1$

$OP^2 = 65$

$OP = \sqrt{65}$

b)



$PT^2 = (\sqrt{65})^2 - (5)^2$

$PT^2 = 65 - 25$

$PT^2 = 40$

$PT = \sqrt{40}$

$PT = 2\sqrt{10}$ or 6.32 units

6. $d \propto \sqrt{h}$

$d = k\sqrt{h}$

when $d = 14$, $h = 16$

$14 = k\sqrt{16}$

$14 = 4k$

$k = 3.5$

$\Rightarrow \quad d = 3.5\sqrt{h}$

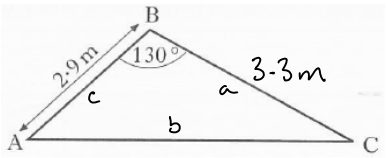
when $h = 40$,

$d = 3.5\sqrt{40}$

$d = 22.14$ km

Distance to horizon is 22.14 km

$\Rightarrow$ Boat at 20km is not beyond the horizon

7. 

$6.2 - 2.9 = 3.3$m

$b^2 = a^2 + c^2 - 2ac\cos B$

$b^2 = (3.3)^2 + (2.9)^2 - 2(3.3)(2.9)\cos 130°$

$b^2 = 31.6$

$b = \sqrt{31.6}$

$b = 5.6$ m

8. (a) $A = \frac{1}{2}ab\sin C$

$A = \frac{1}{2}(15)(18)\sin 70°$

$A = 126.9\ m^2$

(b) Max value of $\sin x° = 1$

when $x = 90°$

$x = 90°$ will give maximum area.

9. (a) $\angle AOB = \frac{5}{12} \cdot 360$

$= 150°$

(b) $\frac{\angle AOB}{360} = \frac{\text{arc length}}{\text{circumference}}$

$\frac{150°}{360°} = \frac{120}{2\pi r}$

$\frac{5}{12} = \frac{60}{\pi r}$

$\frac{5}{12} r = \frac{60}{\pi}$

$r = \frac{60}{\pi} \cdot \frac{12}{5}$

$r = 45.8$ cm

10. (a) $\text{Cost} = £25 \times 4 + 0{\cdot}12 \times (640 - 200)$

$= £152{\cdot}80$

(b) $C = 25d + 0{\cdot}12(m - 200)$

11. (a) $r = \frac{1}{2}n(n-1)$

when $n = 7$,

$r = \frac{1}{2} \cdot 7(7-1)$

$r = \frac{1}{2} \cdot 42$

$r = 21$

(b) when $r = 55$,

$55 = \frac{1}{2}n(n-1)$

$110 = n(n-1)$

$110 = n^2 - n$

$n^2 - n - 110 = 0$

(c) $n^2 - n - 110 = 0$

$(n+10)(n-11) = 0$

either $n + 10 = 0$ or $n - 11 = 0$

$n = -10$ $n = 11$

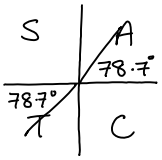
n cannot be negative, therefore the number of towns is 11.

12. (a) $\tan x^\circ = 5$

$x^\circ = \tan^{-1}(5)$

Acute angle $x^\circ = 78{\cdot}7^\circ$

$\Rightarrow x_P = 78{\cdot}7^\circ, \quad x_Q = 258{\cdot}7^\circ$



$180^\circ + 78{\cdot}7^\circ = 258{\cdot}7^\circ$

(b) R will be $78{\cdot}7^\circ$ beyond 360°

$\Rightarrow x_R = 438{\cdot}7^\circ$