

2011 Barker trial HSC exam - General Mathematics Solutions

1. B 2. C 3. D 4. B 5. D 6. B 7. A 8. A 9. B 10. D 11. C

12. D 13. C 14. B 15. B 16. C 17. B 18. C 19. D 20. B 21. B 22. A

23. (a) (i)  $\bar{x} = \frac{18+19+19+20+20+21+22+23+24+24+25+35}{12} = 22.5$

(ii)  $IR = \frac{24+24}{2} - \frac{19+20}{2} = 4.5$

(b)  $160 \cdot \frac{90}{22} = 655$

(c) (i)  $24 \cdot \$76.50 - (\$1895 - \$500) = \$441$

(ii)  $\frac{441 \div (24/12)}{1895-500} \times 100\% \text{p.a.} \approx 11.6\% \text{p.a.}$

(d) (i)  $x = 17 + 3 = 20, y = 11$

(ii)  $\sqrt{9^2 + (18 - 11)^2} \text{m} \approx 11 \text{m}$

(iii)  $\frac{1}{2} \times 14 \times (8 + 9 + 3 + 12) \text{m}^2 = 224 \text{m}^2$

24. (a)  $\frac{3k^2}{2m} \div \frac{mk}{4} = \frac{6k}{m^2}$

(b)  $(3 + 5 + 1.5 \times 4 + 2 \times 2.5) \times \$16.20 = \$307.80$

(c)  $\$4650 + 0.3 \times (\$81970 - \$4260 - \$3700) = \$26853$

(d) (i)  $\frac{\sin(180^\circ - 24^\circ - 48^\circ) \times 86}{\sin 24^\circ} \text{km} \approx 201 \text{km.}$

(ii)  $\frac{1}{2} \times 86 \times \frac{\sin(180^\circ - 24^\circ - 48^\circ) \times 86}{\sin 24^\circ} \sin 48^\circ \approx 6426 \text{km}^2.$

**Note.** Use the exact value of BC, not 201. If you use 201 the answer is  $6423 \text{km}^2$  which is wrong.

25. (a) (i)  $3 \times 4 \times 3 = 36$

(ii)  $3 \times 4 = 12$

(b) (i)  $\frac{\lfloor 20/3 \rfloor}{20} = \frac{3}{10}$

(ii)  $\frac{9}{20}$

(c) (i)  $\$3.00 + (15 - 12) \times \$0.60 = \$4.80$

- (ii) Fee for Type 1 is \$3.00  
 Fee for Type 2 is \$5.00  
 Fee for Type 3 is  $(10 - 6) \times \$0.60 = \$2.40$   
 $\therefore$  Type 3 is best.

(d) (i)  $\frac{1}{3} \times \pi \times (20/2)^2 \times 25\text{cm}^3 \approx 2618\text{cm}^3$

26. (a)  $\frac{x-1}{2} - \frac{5-x}{2} = \frac{2x-2-15+3x}{6} = \frac{5x-17}{6} = 4 \therefore x = \frac{4 \times 6 + 17}{5} = \frac{41}{5}$

(b) (i)  $\frac{100 \div 4}{3} (0 + 0 + 2 \times 40 + 4 \times (30 + 26))\text{m}^2 = 2533\frac{1}{3}\text{m}^2$   
 Alternatively,  $(\frac{100 \div 4}{3} (0 + 40 + 4 \times 30) + \frac{100 \div 4}{3} (40 + 0 + 4 \times 26))\text{m}^2 = 2533\frac{1}{3}\text{m}^2$

(ii)  $2533\frac{1}{3} \times 3.5\text{m}^3 \approx 8867\text{kL}$

(c)  $\frac{\$19195}{(1-0.08)^3} \approx \$24650.44$

(d) (i)  $21 - 12 = 9$

- (ii) Number of goals scored in 1st quarter =  $21 - 12 = 9$   
 Number of goals scored in 2nd quarter =  $27 - 15 = 12$   
 Number of goals scored in 3rd quarter =  $25 - 10 = 15$   
 Number of goals scored in 4th quarter =  $25 - 13 = 12$   
 $\therefore$  quarter in which England scored the most goals was the 3rd.

- (iii) Australia:  $12 + 15 + 10 + 13 = 50$   
 England:  $9 + 12 + 15 + 12 = 48$

27. (a)  $\frac{7.83 \times 10^7}{15 \times 60 \times 60 \times 24} \approx 60.4$  days.

(b) (i)  $32 \div 2^3 = 4$

(ii)  $\left\lceil \frac{\log_{10}(500/4)}{\log_{10} 2} \right\rceil = 7$

(c) (i)  $\$400 \times (1 + \frac{0.066}{12})^{2 \times 12} \approx \$456.28$

(ii)  $\$100 \times \frac{(1 + \frac{0.066}{12})^{2 \times 12} - 1}{0.066/12} = \$2558.10$

(iii) Yes.  $\$100 \times \frac{(1 + \frac{0.066}{12})^{2 \times 12} - 1}{0.066/12} + \$400 \times (1 + \frac{0.066}{12})^{2 \times 12} \approx \$3014.38 > \$3000.$

(d) (i)  $360^\circ - 336^\circ + 38^\circ = 62^\circ$

(ii)  $\sqrt{65^2 + 44^2 - 2 \times 65 \times 44 \times \cos 62^\circ}\text{m} \approx 59\text{m}$

28. (a)  $5000 \times 15 \div 4000\text{cm} = 18.75\text{cm}$

(b) (i) 34

(ii) 3

(c) (i)  $\frac{500-260}{38-20} = \frac{40}{3}$

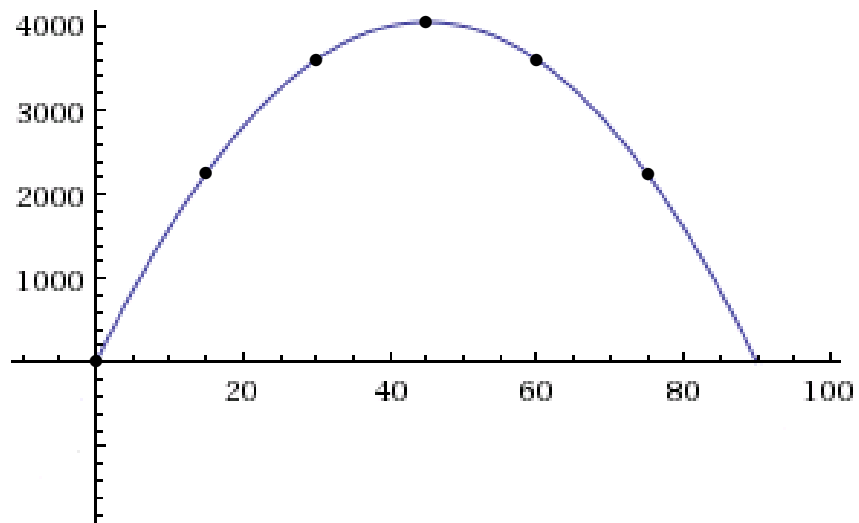
(ii)  $y = 260 + \frac{40}{3}(x - 20) = \frac{40}{3}x - \frac{20}{3}$

(iii)  $\frac{40}{3} \times 15 - \frac{20}{3} \approx 193$

(d) (i)

<i>Length, x m</i>	0	15	30	45	60	75
<i>Area, A m<sup>2</sup></i>	0	2250	3600	4050	3600	2250

(ii)



(iii)  $4050\text{m}^2$