Edexcel IGCSE Higher Tier Mathematics Paper 3 – November 2008

1. $\dfrac{7.9+3.8}{8.6-2.1}=\dfrac{11.7}{6.5}=1.8$

2. (a) $7p-21=7(p-3)$

(b) $4(x+5)=12$

$x+5=\dfrac{12}{4}=3$

$x=3-5=-2$

3. (a) $\text{Mean}=\dfrac{10\times1+9\times2+3\times3+17\times4+11\times5}{50}$

$=\dfrac{160}{50}=3.2$

(b) (i) $\dfrac{17}{50}$

(ii) $\dfrac{10+3}{50}=\dfrac{13}{50}$

(c) No – the scores are not equally likely.

4. (a) Translation by the vector $\begin{pmatrix}-7\\-1\end{pmatrix}$

(b) Rotation of $90°$ about the origin.

5. (a) $0.65\times180=£117$

(b) Let normal price be £x

$0.35x=84$

$x=\dfrac{84}{0.35}=240$

Normal price of the clock is £240

(c) Let normal price be £y

$0.65y = 442$

$$x = \frac{442}{0.65} = 680$$

Normal price of the clock is £680

6. Volume $= \pi \times 2.15^2 \times 7.6 = 110 \text{ cm}^3$ (3 sf)

7. $$\frac{2}{5} \div \frac{4}{7} = \frac{\cancel{2}^{1}}{5} \times \frac{7}{\cancel{4}_{2}} = \frac{7}{10}$$

8. (a) (i) $p^5 \times p = p^5 \times p^1 = p^{5+1} = p^6$

(ii) $\dfrac{q^8}{q^3} = q^{8-3} = q^5$

(b) $3(4x-1) - 4(2x-3) = 12x - 3 - 8x + 12 = 4x + 9$

(c) $(y+3)(y+5) = y^2 + 5y + 3y + 15 = y^2 + 8y + 15$

9. $$\cos x = \frac{5.4}{8.7}$$

$$x = \cos^{-1}\left(\frac{5.4}{8.7}\right) = 51.6° \text{ (1 dp)}$$

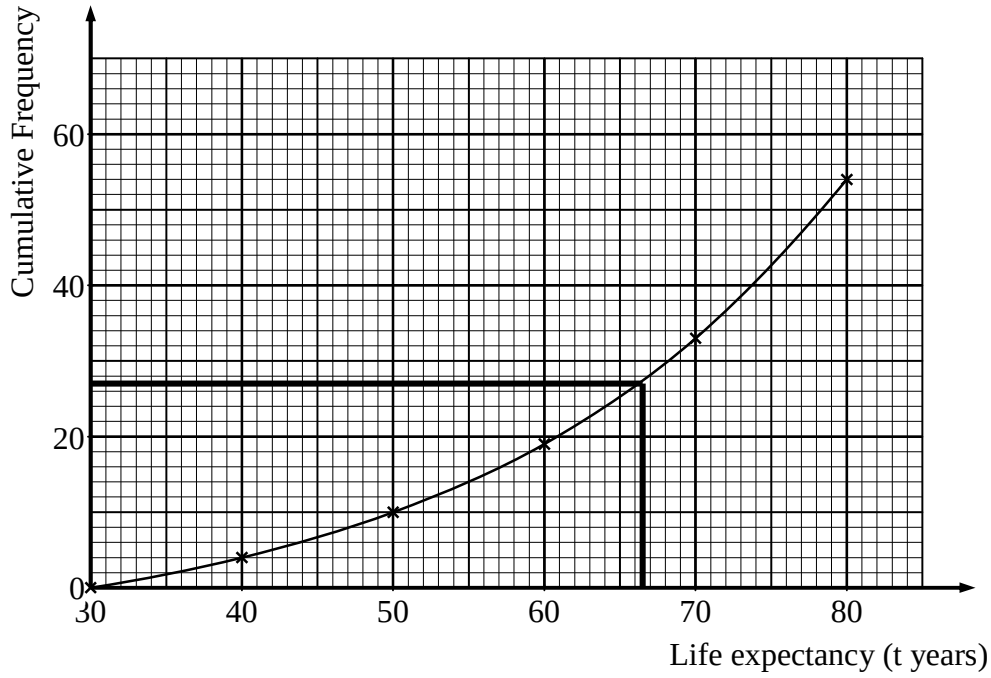
10. (a) Midpoint $= \left(\dfrac{5+(-1)}{2}, \dfrac{13+1}{2}\right) = (2, 7)$

(b) Gradient $AB = \dfrac{13-1}{5-(-1)} = \dfrac{12}{6} = 2$

L has equation $y = 2x + 7$

11. (a) Cumulative frequencies are 4,10,19,33,54

(b)



(c) Read across from half of 54 i.e. 27 and down gives 66.5

12. (a) $\frac{DA}{5.1} = \frac{10}{6}$

$DA = \frac{10 \times 5.1}{6} = 8.5$

$DE = DA - 5.1 = 8.5 - 5.1 = 3.4$ cm

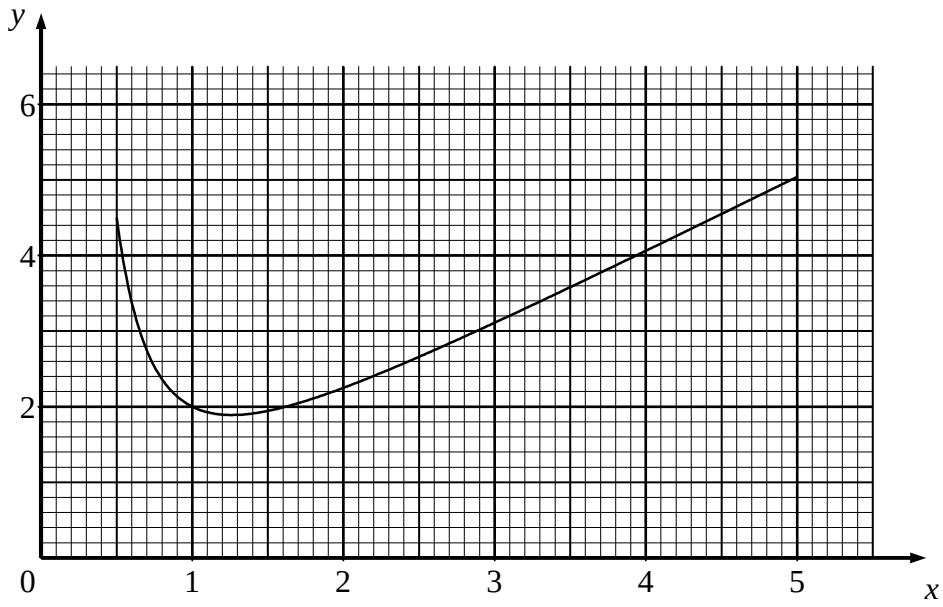
(b) Area of $ABE = \left(\frac{6}{10}\right)^2 = \times$Area of ACD

Area of $BCED = \left(1 - \frac{9}{25}\right) \times$ Area of $ACD = \frac{16}{25} \times$ Area of ACD

$\frac{\text{Area of } ABE}{\text{Area of } BCED} = \frac{9}{16}$

13. (a) Missing values are 4.5, 1.9,3.1,4.1

(b)



(c) (i) $k = 2$ (reading up from 1 and across)

(ii) $x = 1.6$ (reading across from 2 and down)

14. (a) $9ab - 12b^2 = 3b(3a - 4b)$

(b) $(2ab^2)^3 = 2^3a^3(b^2)^3 = 8a^3b^6$

15. (a) $\frac{7}{9} \times \frac{6}{8} = \frac{7}{12}$

(b) $\mathrm{P}(RW) + \mathrm{P}(WR) = \frac{7}{9} \times \frac{2}{8} + \frac{2}{8} \times \frac{7}{9} = \frac{7}{18}$

16. (a) (i) $ACD = 54°$

(ii) Angle between chord and tangent = angle in alternate segment

(b) Angle $DCB = 54 + 36 = 90°$

So by the converse of the angle in a semicircle theorem BD is a diameter

(c) (i) Angle $ABC = 180 - 78 = 102°$

(ii) The opposite angles in a cyclic quadrilateral add to 180 degrees.

17. (a) Let $x = 0.\dot{7}$ (1)

$10x = 7.\dot{7}$ (2)

$9x = 7$ (2) − (1)

$x = \frac{7}{9}$

(b) (i) Let $z = 0.0\dot{y}$ (1)

$10z = 0.\dot{y}$ (2)

$9z = 0.y$ (2) − (1)

$90z = y$

$z = \frac{y}{90}$

(ii) Let $0.1\dot{y} = 0.1 + 0.\dot{y}$

$= \frac{1}{10} + \frac{y}{90}$

$= \frac{9 + y}{90}$

18.

$$\frac{2}{x+2} + \frac{x}{x^2+5x+6} = \frac{2}{x+2} + \frac{x}{(x+2)(x+3)}$$

$$= \frac{2(x+3)+x}{(x+2)(x+3)}$$

$$= \frac{2x+6+x}{(x+2)(x+3)}$$

$$= \frac{3x+6}{(x+2)(x+3)}$$

$$= \frac{3\cancel{(x+2)}}{\cancel{(x+2)}(x+3)}$$

$$= \frac{3}{x+3}$$

19. Area = Area of sector – Area of triangle

$$= \frac{45}{360} \times \pi \times 6.7^2 - \frac{1}{2} \times 6.7 \times 6.7 \times \sin 45°$$

$$= 1.76 \text{ cm}^2 \text{ (3 sf)}$$

20.

$3^2 + r^2 = (2 + r)^2$ (Pythagoras' Theorem)

$9 + r^2 = (2 + r)(2 + r)$

$9 + r^2 = 4 + 2r + 2r + r^2$

$4r + 4 = 9$

$4r = 5$

$r = \frac{5}{4} = 1.25$