

2013 CREDIT MATHS PAPER 1 SOLUTIONS

$$\begin{aligned}
 1. \quad & 86.5 - 3.651 \times 20 \\
 & = 86.5 - 73.02 \\
 & = 13.48
 \end{aligned}$$

$$\begin{array}{r}
 36.51 \\
 \times 2 \\
 \hline
 73.02
 \end{array}
 \qquad
 \begin{array}{r}
 86.50 \\
 - 73.02 \\
 \hline
 13.48
 \end{array}$$

$$\begin{aligned}
 2. \quad & \frac{1}{2} \div 2\frac{2}{3} \\
 & = \frac{1}{2} \div \frac{8}{3} \\
 & = \frac{1}{2} \times \frac{3}{8} \\
 & = \frac{3}{16}
 \end{aligned}$$

3. Any two valid comments eg.

The mean number of cigarettes smoked per person per day dropped from 20.8 to 9.6 suggesting the course had a positive effect.

The standard deviation increased from 8.5 to 12.0 indicating a greater variation in the number of cigarettes smoked.

$$\begin{aligned}
 4. \quad & A = 4\pi r^2 \\
 & \frac{A}{4\pi} = r^2 \\
 & r = \sqrt{\frac{A}{4\pi}}
 \end{aligned}$$

$$\begin{aligned}
 5. (a) \quad & P(\text{male } \geq 60) = \frac{12}{150} \\
 & = \frac{2}{25}
 \end{aligned}$$

$$(b) \quad P(\leq 5) = \frac{7}{150}$$

$$\begin{aligned}
 6. (a) \quad & 2g + 5s = 125 \quad (1) \\
 (b) \quad & 4g + 3s = 145 \quad (2)
 \end{aligned}$$

$$\begin{aligned}
 (c) \quad & 4g + 10s = 250 \quad (1) \times 2 \\
 & - 4g + 3s = 145 \quad (2) \\
 \hline
 & 7s = 105 \\
 & s = 15
 \end{aligned}$$

sub $s = 15$ into (1)

$$\begin{aligned}
 2g + 5(15) & = 125 \\
 2g + 75 & = 125 \\
 2g & = 50 \\
 g & = 25
 \end{aligned}$$

check using (2)

$$\begin{aligned}
 4(25) + 3(15) & = 145 \\
 100 + 45 & = 145 \\
 \text{LHS} & \equiv \text{RHS}
 \end{aligned}$$

A gold charm costs £25, silver charm is £15.

$$\begin{aligned}
 7. (a) \quad & (2x-5)(x^2+3x-7) \\
 & = 2x(x^2+3x-7) - 5(x^2+3x-7) \\
 & = 2x^3 + 6x^2 - 14x - 5x^2 - 15x + 35 \\
 & = 2x^3 + x^2 - 29x + 35
 \end{aligned}$$

$$\begin{aligned}
 (b) \quad & 4x - 5 \leq 7x - 20 \\
 & -5 \leq 3x - 20 \\
 & 15 \leq 3x \\
 & 5 \leq x \\
 & x \geq 5
 \end{aligned}$$

$$\begin{aligned}
 8. \quad & 2x + y = 3 \\
 & y = -2x + 3 \\
 & \quad \uparrow \quad \quad \uparrow \\
 & \text{negative} \quad \text{positive} \\
 & \text{gradient} \quad \text{y-intercept}
 \end{aligned}$$

\Rightarrow matches graph D

$$\begin{array}{r}
 9. (a) \quad 12 \times 50p = \text{£}6 \\
 4 \times 35p = \text{£}1.40 \\
 \quad \quad \quad \text{CD} = \text{£}4.25 \\
 \hline
 \quad \quad \quad \text{Total} = \text{£}11.65
 \end{array}$$

$$\begin{aligned}
 (b) \quad C &= 0.35(x-12) + 6 + 4.25 \\
 C &= 0.35x - 4.20 + 10.25 \\
 C &= 0.35x + 6.05
 \end{aligned}$$

$$\begin{aligned}
 10. (a) \quad & \text{on } x\text{-axis } y = 0 \\
 & \Rightarrow x^2 - 2x - 3 = 0 \\
 & (x-3)(x+1) = 0 \\
 & \text{either } x-3 = 0 \quad \text{or } x+1 = 0 \\
 & \quad \quad \quad x = 3 \quad \quad \quad x = -1 \\
 & \Rightarrow A(-1, 0) \quad \& \quad B(3, 0)
 \end{aligned}$$

(b) $x = 1$ is axis of symmetry

$$\begin{aligned}
 11. (a) \quad & 9^2 - 8 \times 10 = 1 \\
 (b) \quad & (n+1)^2 - n(n+2) \\
 & = n^2 + 2n + 1 - n^2 - 2n \\
 & = 1
 \end{aligned}$$

PROVED