

Edexcel GCE
Statistics S1
Gold Level G3
(Mark Scheme)

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Question Number	Scheme	Marks
1. (a)	$b = \frac{18.35}{312.1} [= 0.058795\dots]$ $a = 5.8 - "0.058795\dots" \times 4.8$ <p style="text-align: right;"><u>a = awrt 5.52</u></p> <p>So <u>y = 5.52 + 0.0588x</u></p>	M1 M1 A1 A1 (4)
	(b)	M1
	$\frac{e}{10} = "5.52" + "0.0588" \times \left(\frac{g - 60}{4} \right)$ $4e = 220.71 + 0.588(g - 60)$ <p style="text-align: right;"><u>e = 46 + 0.15g</u></p>	dM1 A1A1 (4)
	(c)	M1
	$e = "46" + "0.15" \times 100$ <p style="text-align: right;"><u>= 61</u></p>	A1 (2)
		[10]
2. (a)	(R and S are mutually) exclusive.	B1 (1)
	(b)	M1
	$\frac{2}{3} = \frac{1}{4} + P(B) - P(A \cap B)$ <p style="text-align: right;">use of Addition Rule</p>	
	$\frac{2}{3} = \frac{1}{4} + P(B) - \frac{1}{4} \times P(B)$ <p style="text-align: right;">use of independence</p>	M1 A1
	$\frac{5}{12} = \frac{3}{4} P(B)$	
	$P(B) = \frac{5}{9}$	A1 (4)
	(c)	M1A1ft (2)
	$P(A' \cap B) = \frac{3}{4} \times \frac{5}{9} = \frac{15}{36} = \frac{5}{12}$	
	(d)	M1
	$P(B' A) = \frac{(1 - (b)) \times 0.25}{0.25} \quad \text{or } P(B') \text{ or } \frac{1}{9}$	
	$= \frac{4}{9}$	A1 (2)
		[9]

Question Number	Scheme	Marks
<p>3. (a)</p> <p>(b)</p>	<p>1(cm) cao</p> <p>10 cm² represents 15 10/15 cm² represents 1</p> <p>Therefore frequency of 9 is $\frac{10}{15} \times 9$ or $\frac{9}{1.5}$</p> <p>height = 6 (cm)</p>	<p>B1 (1)</p> <p>M1</p> <p>M1</p> <p>A1 (2)</p> <p>[3]</p>
<p>4. (a)</p> <p>(b)</p> <p>(c)</p>	<p>$[P(M < 145) =] P\left(Z < \frac{145-150}{10}\right)$</p> <p style="text-align: center;">$= P(Z < -0.5)$ or $P(Z > 0.5)$</p> <p style="text-align: center;">$= \text{awrt } \underline{\mathbf{0.309}}$</p> <p>$[P(B > 115) = 0.15 \Rightarrow] \frac{115-100}{d} = 1.0364$ (Calc gives 1.036433...)</p> <p style="text-align: center;">$\underline{\mathbf{d = 14.5}}$ (Calc gives 14.4727...)</p> <p>$[P(X > \mu + 15 X > \mu - 15) =] \frac{P(X > \mu + 15)}{P(X > \mu - 15)}$</p> <p style="text-align: center;">$= \frac{0.35}{1-0.35}$</p> <p style="text-align: center;">$= \underline{\underline{\frac{7}{13}}}$ or awrt 0.538</p>	<p>M1</p> <p>A1</p> <p>A1 (3)</p> <p>M1B1</p> <p>A1</p> <p>A1 (4)</p> <p>M1</p> <p>A1</p> <p>A1 (3)</p> <p>[10]</p>

Question Number	Scheme	Marks
5. (a)	$\frac{127-100}{15}$	M1
	So $P(L > 127) = P(Z > 1.8)$ or $1 - P(Z < 1.8)$ o.e.	A1
	$= 1 - 0.9641 = \underline{\mathbf{0.0359}}$	A1
		(awrt <u>0.0359</u>)
(b)	$\frac{d-100}{15} = -1.2816 \quad (\text{Calculator gives } -1.2815515\dots)$	M1, B1
	$d = 80.776$	A1
(c)	Require $P(L > 133 \mid L > 127)$	M1
	$= \left[\frac{P(L > 133)}{P(L > 127)} \right] = \frac{P(Z > 2.2)}{P(L > 127)}$	dM1
	$= \left[\frac{1-0.9861}{1-0.9641} \right] = \frac{0.0139}{[0.0359]}$	A1
	$= 0.3871\dots = \text{awrt } \underline{\mathbf{0.39}}$	A1
		(4) [10]

Question Number	Scheme	Marks
6. (a)	8-10 hours: width = 10.5 - 7.5 = 3 represented by 1.5cm	
	16-25 hours: width = 25.5 - 15.5 = 10 so represented by <u>5 cm</u>	B1
	8- 10 hours: height = fd = 18/3 = 6 represented by 3 cm	M1
	16-25 hours: height = fd = 15/10 = 1.5 represented by <u>0.75 cm</u>	A1
(b)	$Q_2 = 7.5 + \frac{(52-36)}{18} \times 3 = 10.2$	(3) M1 A1
	$Q_1 = 5.5 + \frac{(26-20)}{16} \times 2 [= 6.25 \text{ or } 6.3]$ or $5.5 + \frac{(26.25-20)}{16} \times 2 [=6.3]$	A1
	$Q_3 = 10.5 + \frac{(78-54)}{25} \times 5 [= 15.3]$ or $10.5 + \frac{(78.75-54)}{25} \times 5 [=15.45 \setminus 15.5]$	A1
	IQR = (15.3 - 6.3) = <u>9</u>	A1ft (5)
(c)	$\sum fx = 1333.5 \Rightarrow \bar{x} = \frac{1333.5}{104} =$ awrt <u>12.8</u>	M1 A1
	$\sum fx^2 = 27254 \Rightarrow \sigma_x = \sqrt{\frac{27254}{104} - \bar{x}^2} = \sqrt{262.05 - \bar{x}^2}$ awrt <u>9.88</u>	M1 A1
(d)	$Q_3 - Q_2 [= 5.1] > Q_2 - Q_1 [= 3.9]$ or $Q_2 < \bar{x}$	(4) B1ft
	So data is positively skew	dB1
(e)	Use median and IQR,	B1
	since data is skewed <u>or</u> not affected by extreme values or outliers	B1
		(2) [16]

Question Number	Scheme	Marks
<p>7. (a)</p> <p>(b)</p> <p>(c)</p>	<p>[Let X be the amount of beans in a tin. $P(X < 200) = 0.1$]</p> $\frac{200 - \mu}{7.8} = -1.2816$ <p>[calc gives 1.28155156...]</p> $\mu = 209.996\dots$ <p>awrt 210</p> <p>$P(X > 225) = P\left(Z > \frac{225 - "210"}{7.8}\right)$</p> <p>$= P(Z > 1.92)$ <u>or</u> $1 - P(Z < 1.92)$ (allow 1.93)</p> <p>$= 1 - 0.9726 = 0.0274$ (or better) [calc gives 0.0272037...]</p> <p>$= 0.0274$</p> <p>$=$ awrt 2.7% allow 0.027</p> <p>[Let Y be the new amount of beans in a tin]</p> $\frac{210 - 205}{\sigma} = 2.3263 \text{ or } \frac{200 - 205}{\sigma} = -2.3263$ <p>[calc gives 2.3263478...]</p> $\sigma = \frac{5}{2.3263}$ <p>$\sigma = 2.15$ (2.14933...)</p>	<p>M1 B1</p> <p>A1</p> <p>(3)</p> <p>M1</p> <p>A1</p> <p>A1</p> <p>(3)</p> <p>M1 B1</p> <p>dM1</p> <p>A1</p> <p>(4)</p> <p>[10]</p>
<p>8. (a)(i)</p> <p>(ii)</p> <p>(b)</p> <p>(c)</p> <p>(d)</p>	<p>$P(A \cup B) = a + b$ cao</p> <p>$P(A \cup B) = a + b - ab$ or equivalent</p> <p>$P(R \cup Q) = 0.15 + 0.35$</p> <p>$= 0.5$</p> <p>$P(R \cap Q) = P(R Q) \times P(Q)$</p> <p>$= 0.1 \times 0.35$</p> <p>$= 0.035$</p> <p>$P(R \cup Q) = P(R) + P(Q) - P(R \cap Q)$ <u>or</u> $P(R) = P(R \cap Q') + P(R \cap Q)$</p> <p>$= 0.15 + \text{their (c)}$</p> <p>$0.5 = P(R) + 0.35 - 0.035$ $= 0.15 + 0.035$</p> <p>$P(R) = 0.185$ $= 0.185$</p>	<p>B1</p> <p>B1</p> <p>(2)</p> <p>B1</p> <p>(1)</p> <p>M1</p> <p>A1</p> <p>(2)</p> <p>M1</p> <p>A1</p> <p>(2)</p> <p>[7]</p>

Statistics for S1 Practice Paper Gold Level G3

Qu	Max Score	Modal score	Mean %	Mean score for students achieving grade:							
				ALL	A*	A	B	C	D	E	U
1	10		70	7.02	8.94	8.33	6.78	5.85	5.23	4.72	3.34
2	9		46	4.15	7.92	6.66	3.97	2.98	2.28	1.81	1.09
3	3		47	1.40		2.27	1.57	1.17	0.92	0.64	0.45
4	10		70	6.99	9.01	8.21	7.01	6.02	5.02	3.62	2.08
5	10	6	45	4.53	6.79	5.70	4.80	3.99	3.27	2.63	1.43
6	16		46	7.28		11.14	7.55	5.26	3.51	2.42	0.92
7	10	0	43	4.32	8.55	7.78	5.59	4.04	2.74	1.72	0.65
8	7		47	3.28		5.54	3.78	2.71	1.88	1.37	0.69
	75		52	38.97		55.63	41.05	32.02	24.85	18.93	10.65