4(a)	$[2 \times]\ z \times \frac{\sigma}{\sqrt{n}} = 1.414 \times [2 \times]\ 1.645 \times \frac{\sigma}{\sqrt{n}}$ $[\ z = 2.326\ ]$
	$2\Phi(‘2.326’) - 1$
	$\alpha = 98$ (3 sf)
4(b)	$\frac{90}{'98'} = \frac{45}{49}$ or 0.918 (3 sf)

3(a)	Sample mean = 32.5 soi or Width = 2.96
	$32.5 + 1.96 \times \frac{\sigma}{\sqrt{100}} = 33.98$ or $2.96 = 2 \times 1.96 \times \frac{\sigma}{\sqrt{100}}$
	$\sigma = 7.55$ (3 sf)
3(b)	Because the sample size is large.
3(c)	$0.95^r > 0.5$ Allow ‘=’
	$r \ln 0.95 > \ln 0.5$ Allow ‘=’ Correctly take logs and use log rule
	$r < 13.5\ldots$ Allow ‘=’
	Largest value of r is 13

2(a)	N (6, ….)
	$\sigma^2 = \frac{3}{2} = 1.5$ (or $\sigma = \sqrt{1.5}$ or $\frac{\sqrt{6}}{2}$ or 1.22 (3sf)
	$\frac{6.2 - 6}{\sqrt{\frac{1.5}{100}}}$
	= 1.633
	$\mathrm{P}\left(\overline{X} > 6.2\right) = 1 - \Phi(‘1.633’)$
	= 0.0512 or 0.0513 (3sf)
2(b)	Population (X) is not normally distributed / Population (X) is Binomial

3(a)	$\mathrm{Est}(\mu) = \frac{2750}{60}$ or $\frac{275}{6}$ or 45.8 (3 sf)
	$\mathrm{Est}(\sigma^2) = \frac{60}{59}\left(\frac{127000}{60} - \left(\frac{275}{6}\right)^2\right)$
	=16.2 (3 sf) or $\frac{2875}{177}$

3(b)	H_o: Population mean time = 45 H_1: Population mean time > 45
	$\dfrac{\dfrac{'275'}{6} - 45}{\sqrt{\dfrac{'16.24294'}{60}}}$
	= 1.602 to 1.595
	‘1.602’ < 1.645
	[Accept H_0] There is insufficient evidence [at 5% level] to reject the company’s claim OR There is insufficient evidence to accept the passenger’s belief OR There is insufficient evidence that the mean time is more than 45 minutes

6(a)	H0: Proportion (at college) owning Pumpkin phone = 0.25 H1: Proportion (at college) owning Pumpkin phone < 0.25
6(b)	B(30, 0.1) and P($X \geqslant$ 5) attempted
	$1-(0.9^{30} + 30\times0.9^{29}\times0.1 + {}^{30}C_2\times0.9^{28}\times0.1^2 + {}^{30}C_3\times0.9^{27}\times0.1^3 + {}^{30}C_4\times0.9^{26}\times0.1^4)$ $= 1 - (0.042391 + 0.141304 + 0.22766 + 0.236088 + 0.177066)$
	= 0.175 (3 sf) accept 0.176
6(c)	$\dfrac{1}{8} \pm z\sqrt{\dfrac{\dfrac{1}{8}\times\dfrac{7}{8}}{40}}$