2	est (μ) = 499.5 or 29970/60
	est (σ^2) = $\frac{60}{59}\left(\frac{14970300}{60} - \text{‘}499.5\text{’}^2\right)$ or $1/59(14970300 - (29970)^2/60)$
	= 4.83 or 285/59
	H_0: Pop mean (or μ) = 500 H_1: Pop mean (or μ) $\neq$ 500
	$\dfrac{'499.5'-500}{\frac{\sqrt{'4.83'}}{\sqrt{60}}}$
	= –1.762
	‘1.762’ < 1.96 or −’1.762’ > −1.96 0.0390 > 0.025
	There is insufficient evidence that [mean] mass is not 500g

5(a)	$P(X \leq 2) = 0.8^{40} + 40\times0.8^{39}\times0.2 + {}^{40}C_2\times0.8^{38}\times0.2^2$ $= 0.0001329 + 0.0013292 + 0.0064799$
	= 0.00794 (< 0.025)
	$P(X \leq 3) = [0.00794 + {}^{40}C_3\times0.8^{37}\times0.2^3]$ $= 0.0079421 + 0.0205199 = 0.0285 > 0.025$
	P(Type I) = 0.00794 (3 sf) with both relevant comparisons seen

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5(b)	Rejection region is $X \leqslant 2$
5(c)	H_0 will be rejected Or result lies in the rejection region

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4(a)	Assume flaws in cups are independent OR prob of containing a flaw is the same for all cups
	H_0: P(contains flaw) = 0.18 H_1: P(contains flaw) < 0.18
	[$P(X \leqslant 3)$ =] $0.82^{40} + 40\times0.82^{39}\times0.18 + {}^{40}C_2\times0.82^{38}\times0.18^2 + {}^{40}C_3\times0.82^{37}\times0.18^3$ $=0.0003569 + 0.0031338 + 0.013414 + 0.037298$
	0.0542 (3 sf)
	0.0542>0.05
	[Accept H_o] Insufficient evidence to accept factory owners claim. [Insufficient evidence that percentage less than 18%]

4(b)	$np = 7.2$ which is too large, or > 5. Or $n = 40$ which is not greater than 50. Or $p = 0.18$ which is not small or > 0.1.

6(a)	Assume sd is still 26 or is unchanged
	H_0: Population mean = 736 H_1: Population mean < 736
	$\pm\dfrac{725-736}{\frac{26}{\sqrt{35}}}$
	$= -2.503$
	$-2.503 < -2.054$(or 5 or 6) or $0.0062 < 0.02$
	[Reject Ho] There is sufficient evidence that (mean) weekly profit has decreased
6(b)	0.02

6(c)	$\frac{a-736}{\frac{26}{\sqrt{35}}} = -2.054$ or -2.055
	$a = 726.973$
	$\frac{'726.973'-718}{\frac{26}{\sqrt{35}}}$ $(= 2.042)$
	$= 1 - \phi('2.042')$
	$= 0.0203$ to 0.0207

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

3(b)	H_o: Population mean time = 45 H_1: Population mean time > 45
	$\dfrac{\frac{'275'}{6} - 45}{\sqrt{\frac{'16.24294'}{60}}}$
	= 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)	$\frac{1}{8} \pm z\sqrt{\dfrac{\frac{1}{8}\times\frac{7}{8}}{40}}$