Question Number	Scheme	Marks
8 (a)	$P(X > \mu + 2k) = 0.2$ or $P(X < \mu - 2k) = 0.2$ or $P(X < \mu + 2k) = 0.8$ or $P(X > \mu - 2k) = 0.8$	M1
	$\frac{\mu + 2k - \mu}{6} = 0.8416$ or $\frac{\mu - 2k - \mu}{6} = -0.8416$	M1 A1
	$k = 2.5248...$ awrt 2.52	A1
		(4)
(b)	$P\left(Y > \frac{3}{2}\mu\right) \Rightarrow P\left(Z > \frac{\frac{3}{2}\mu - \mu}{\sigma}\right) \Rightarrow P\left(Z > \frac{\frac{1}{2}\mu}{\sigma}\right)$	M1
	$\mu = \frac{3}{2}\sigma^2 \Rightarrow P\left(Z > \frac{'\frac{1}{2}\left(\frac{3}{2}\sigma^2\right)'}{\sigma}\right)\left[= P\left(Z > \frac{3}{4}\sigma\right)\right]$ or $\sigma = \sqrt{\frac{2\mu}{3}} \Rightarrow P\left(Z > \frac{\frac{1}{2}\mu}{\sqrt{\frac{2\mu}{3}}}\right) = \left[P\left(Z > \frac{1}{2}\sqrt{\frac{3\mu}{2}}\right)\right]$ or $\frac{\frac{1}{2}\mu}{\sigma} = k$ and $2\mu = 3\sigma^2$	M1
	$'\frac{3}{4}\sigma' = 1.5$ or $\frac{1}{2}\sqrt{\frac{3\mu}{2}} = 1.5$ or $3\sigma^2 = 6\sigma$	M1
	$\mu = 6$ only, $\sigma = 2$ only	A1 A1
		(5)

	Notes	**Total 9**
(a)	**M1**	For any of the given tail probability statements which may be seen on a diagram Also may be implied by awrt ±0.84 seen
	M1	For standardising using μ and 6 and setting = to *z* value, where $0.8 < \lvert z \rvert < 0.9$ Implied by $(\pm)\frac{k}{3} = (\pm)0.84$ or better
	A1	For a fully correct standardisation with a compatible *z* value. $\lvert z \rvert$ must be 0.8416 or better
	A1	awrt 2.52 (Allow 2.525) Answer only 2.52 is M1M1A0A1 Answer only 2.5248 is M1M1A1A1
(b)	**M1**	For standardising using $\frac{3}{2}\mu$, μ and σ
	M1	For substitution of $\mu = \frac{3}{2}\sigma^2$ into their standardisation **or** setting up two equations in μ and σ
	M1	For their expression for σ only or μ only used with ±1.5
	A1	$\mu = 6$ or $\sigma = 2$
	A1	$\mu = 6$ and $\sigma = 2$ must reject any other values if found

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