4	$\frac{1}{4}\times 28\times(28+1)$ $[=203]$ $\frac{1}{24}\times 28\times(28+1)\times(56+1)$ $[=1928.5]$
	$[z=]\dfrac{T+0.5-'203'}{\sqrt{'1928.5'}}$
	$\dfrac{T+0.5-'203'}{\sqrt{'1928.5'}}>-2.576$
	$T>89.4$
	$T=90$

1(a)	Data has outliers / is skewed / lacks symmetry, suggesting population/distribution may not be symmetrical.
1(b)	H_0: population median is [$]32,500. H_1: population median is not [$]32,500.
	Test statistic = 4 (or 11)
	[$X \sim B(15,0.5)$] $P(X \leqslant 4)=0.0592$ OR $P(X \geqslant 11)=0.0592$
	$'0.0592'>0.05$, accept H_0 / do not reject H_0 / not significant.
	Insufficient evidence to reject [company's] claim. OR Insufficient evidence to suggest that median [salary] is not [$]32,500.

6(a)	H_0: population median mark for school A is equal to population median mark for school B. H_1: population median mark for school A is not equal to population median mark for school B.
	$\frac{1}{2}\times 123(123+147+1)$ $[=16666.5]$ $\frac{1}{12}\times 123\times 147(123+147+1)$ $[=408329.25]$
	$\dfrac{15355+0.5-'16666.5'}{\sqrt{'408329.25'}}$
	-2.05
	$-2.05<-1.96$ OR $0.980>0.975$ OR $0.020<0.025$ OR $15355+0.5<15414$, reject H_0 / significant.
	Sufficient evidence to suggest that there is a difference in average marks between the students in school A and B. OR Sufficient evidence to suggest that, on average, the test scores for students at the two schools are not equal.
6(b)	The (underlying) distributions are symmetrical/similar shape. OR The populations are symmetrical/similar shape. OR No repeated marks.

5(a)	$H_0: m_s = m_c$ $H_1: m_s > m_c$
	(see table below)
	$(P=51,\ Q=4)$ $T=4$
	$'4'\leqslant 10$, reject H_0 (significant).
	Sufficient evidence to suggest that children, on average, complete the cartoon puzzle more quickly than the seaside puzzle. OR Sufficient evidence to support the researcher's belief.
5(b)	$[X\sim B(10,0.5)]$ $P(X\leqslant 2)=0.0547$
	$'0.0547'>0.05$, accept H_0 (not significant).
	In part **5(a)** H_0 is rejected, in part **5(b)** H_0 is accepted, so opposite conclusion reached.
5(c)	The order of the tests means that children may do the second test quicker (or slower) because, for example, they have had practice (or are tired).

d	21	19	–2	22	–10	4	16	27	35	29
Rank	6	5	–1	7	–3	2	4	8	10	9

4

H_0: **population** medians are equal for under 25s and over 50s (or $m_{<25} = m_{>50}$).
H_1: **population** median for under 25s < **population** median time for over 50s (or $m_{<25} < m_{>50}$).

198	**5**	178	**1**
212	**8**	181	**2**
217	**9**	183	**3**
229	**11**	192	**4**
235	**13**	203	**6**
242	**14**	209	**7**
		223	**10**
		231	**12**

Sum of ranks for sample of size 6: $R_6 = 60$

$6(6+8+1) - 'R_6'$ $[=30]$

$[W = \min(60,30) =]$ 30

Critical value for $n = 6$, $m = 8$ is 31.

$'30' \leqslant 31$, reject H_0 (significant).

Sufficient evidence to suggest that older people take longer to react.
OR Sufficient evidence to support researcher's claim.