Solutions 3.

(1) $\text{mean} = \frac{27+45+\ldots+38}{10} = 37.8$

Ordered: 27, 32, 33, 34, 36, 38, 39, 45, 45, 49

$\text{Median} = \frac{36+38}{2} = 37$

Mode: 45

(2) Median < Mean
Skewed to the right

(3) $\text{mean} = \frac{36.8(4) + 37.1(6) + \ldots\ 37.7(8)}{25} = 37.312^\circ C$

mode = 37.7°C (most frequently occurring)

Median is the $0.5(25+1) = 13^{th}$ measurement when data is ordered.

Median = 37.4°C

(4) Caution: Data is not ordered

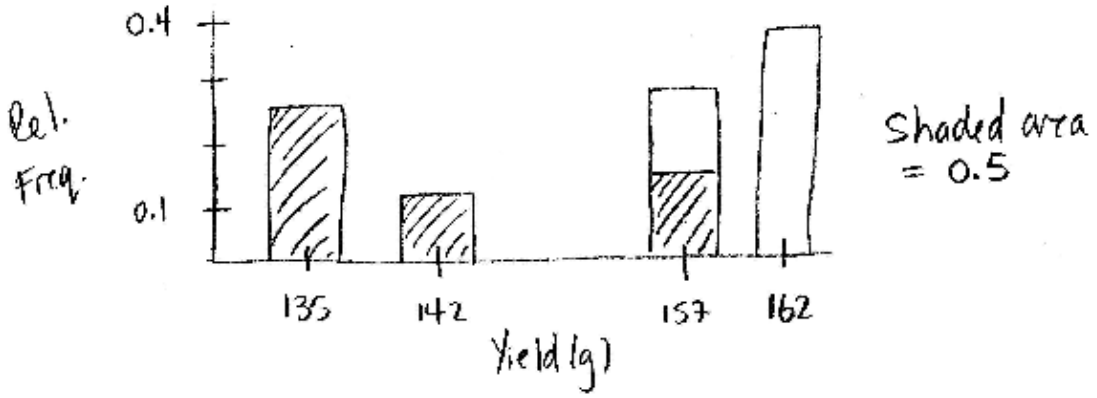
In order:

Yield (g)	Relative Frequency
135	0.24
142	0.13
157	0.25
162	0.38

mean = $135(0.24) + \ldots + 162(0.38) = 151.67$ g

mode = 162 g (most frequently occurring)

median: histogram might be helpful



median = 157 g

(5)

30	1 8 7
31	7 8 1
32	1 2 5 5 6
33	4 3 4 4 9

→

30	1 7 8
31	1 7 8
32	1 2 5 5 6
33	3 4 4 4 9

a) mean = 322.1875

b) median = $\frac{322+325}{2}$ = 323.5

c) mode = 334

d) 4th smallest measurement = 311

(6) Position is $0.5(1013+1) = 507$

The 507^{th} measurement is the median.

(7) Position is $0.5(500+1) = 250.5$

The median is the average of the 250^{th} and the 251^{st} measurements.

(8) Let x = 4th test mark

Want $\frac{65+72+78+x}{4} = 75$

$$65+72+78+x = 300$$

$$x = 85$$

The student must earn 85 on the 4th test.

(9) Let x_1, x_2, x_3, x_4 be the 4 test marks.

Given $\frac{x_1+x_2+x_3}{3} = 67$ (1)

Want $\frac{x_1+x_2+x_3+x_4}{4} = 73$ (2)

(1): $x_1 + x_2 + x_3 = 201$ (3)

(2): $x_1 + x_2 + x_3 + x_4 = 292$ (4)

(4) - (3): $x_4 = 91$

The 4th test mark must be 91.

(10) Estimate using the mean of the endpoints:

	Score	Frequency
$\frac{50+60}{2}$ →	55	3
→	65	11
$\frac{60+70}{2}$	75	22
	85	6
→	95	4
$\frac{90+100}{2}$		

$$\text{mean} \approx \frac{55(3) + 65(11) + \ldots + 95(4)}{46}$$

$$\approx 74.3$$