Mathematics 306/326
REVIEW 4

**1** A game involves throwing a dart at a target. You can win a prize if your dart lands in one of the shaded areas of the target.

Players can choose from among the four targets illustrated below.

### Target A



The four shaded areas are congruent squares

### Target C



The four shaded areas are congruent circles, each with a radius of 5 cm.
The radius of the target is 15 cm.

### Target B



The radius of the smaller circle is 8 cm.
The radius of the larger circle is 15 cm.

### Target D



The target is a square.

Which target should players choose to have the best chance of winning?

A) Target A  
B) Target B  

C) Target C  
D) Target D

**2** The diagram on the right shows a square target. Its sides measure 50 cm each.

The design used on this target was created by drawing two squares whose sides measure 40 cm and 30 cm respectively.

A section of this target is white.

Someone throws a dart at this target.



What is the probability that the dart will land in the white section of the target?

A) $\dfrac{1}{6}$

B) $\dfrac{7}{25}$

C) $\dfrac{1}{3}$

D) $\dfrac{16}{25}$

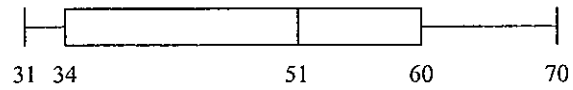**3** The following box-and-whisker plot is based on a statistical distribution consisting of 18 data values.

$$\text{31} \quad \text{34} \qquad\qquad \text{51} \qquad \text{60} \qquad \text{70}$$

Below are 16 of the 18 data values.

31   32   33   34   34   37   41   47   52   57   57   59   61   63   68   70

What are the two missing data values in this distribution?

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Show all your work.

Box-and-whisker plot for the 18 data values

$$\text{31} \quad \text{34} \qquad\qquad \text{51} \qquad \text{60} \qquad \text{70}$$

16 of the 18 data values

31   32   33   34   34   37   41   47   52   57   57   59   61   63   68   70

Answer:    The two missing data values in this distribution are _____ and _____.

**1** D        **2** B
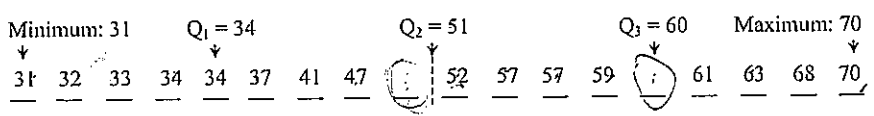
**3** Example of an appropriate method

➢        Position of the quartiles in the distribution

Since there are 18 data values in the distribution, we can determine the position of the quartiles.

Minimum: 31        $Q_1 = 34$        $Q_2 = 51$        $Q_3 = 60$        Maximum: 70
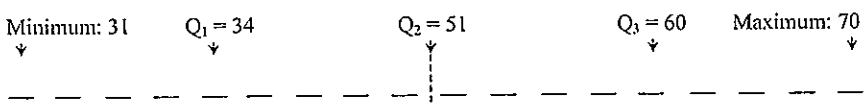
➢        Position of the two missing values

Position the 16 known values.

Minimum: 31        $Q_1 = 34$        $Q_2 = 51$        $Q_3 = 60$        Maximum: 70

31   32   33   34   34   37   41   47   :   52   57   57   59   :   61   63   68   70

The missing values are the $9^{th}$ lowest and the $5^{th}$ highest.

➢        The two missing values

The second quartile corresponds to the mean of the $9^{th}$ and $10^{th}$ lowest values in the distribution. Since the $10^{th}$ lowest value is 52 and the second quartile is 51, we can conclude that the $9^{th}$ lowest value in the distribution is 50.

One of the missing values is therefore 50.

The third quartile corresponds to the 5th highest value in the distribution. The $5^{th}$ highest value must therefore be 60.

One of the missing values is therefore 60.

Answer:        The two missing data values in this distribution are 50 and 60.

Note:        Students who used an appropriate method in order to determine the position of either of the missing values have shown that they have a partial understanding of the problem.