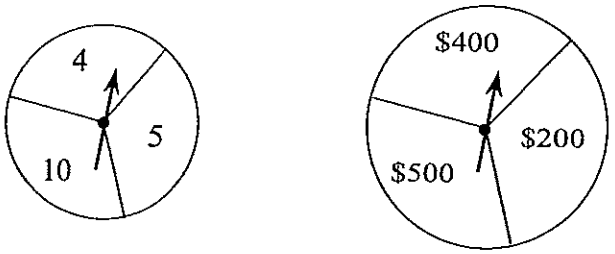
ADVANCED – CHANCE AND DATA

PART A

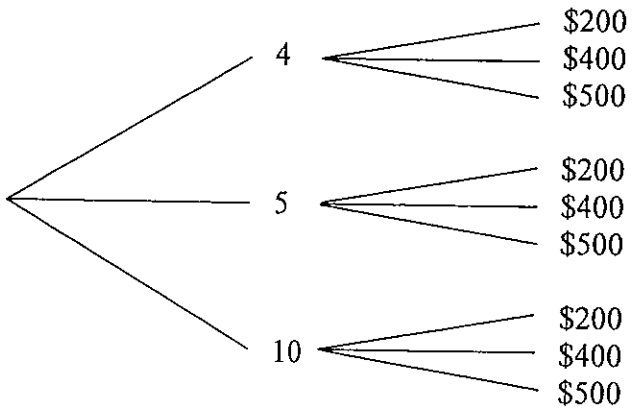
1. The difference between the median and the range for the scores 4, 11, 5, 13, 12 is:

A) 3 B) 2 C) 1 D) 0

2.



Each of the spinners above is to be spun once to get a prize that is equal to the product of the numbers obtained. The tree diagram below shows the possible outcomes.



John is to play this game. What is the probability that he will win a prize worth more than $2000 ?

A) $\frac{2}{3}$ B) $\frac{1}{2}$ C) $\frac{3}{4}$ D) $\frac{1}{3}$

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3. The names of all 20 students in a class are written on individual cards and placed in a hat. Each member selects a card at random and keeps it to buy a kris kringle gift for the student whose name is on it.
If a student draws his or her own name the card is replaced and another is drawn.

Samantha selected John's name at random and John has the second turn. What is the probability that he will randomly select Samantha's name?

A) $\frac{1}{20}$ B) $\frac{1}{19}$ C) $\frac{1}{18}$ D) $\frac{1}{10}$

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4. Adam and some of his friends played three games of ten pin bowling. Adam's results are shown below:

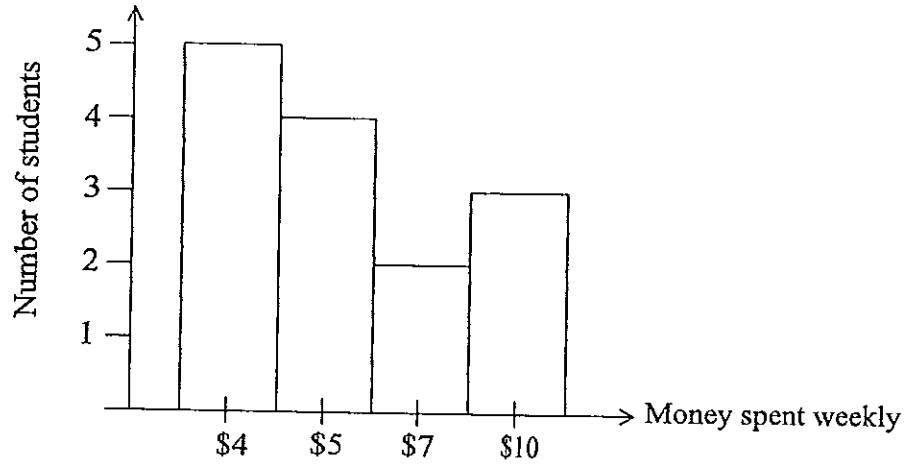
Game	Group Mean	Group Standard Deviation	Adam's Result
Game 1	120	10	132
Game 2	136	9	145
Game 3	140	16	148

In which game did Adam perform best, compared to the rest of his friends ?

A) Game 1 B) Game 2 C) Game 3 D) All games

PART B

5. The frequency histogram below represents the amount of pocket money spent weekly by a group of year four students in their school canteen.



Find the average weekly amount of money spent by the members of this group.

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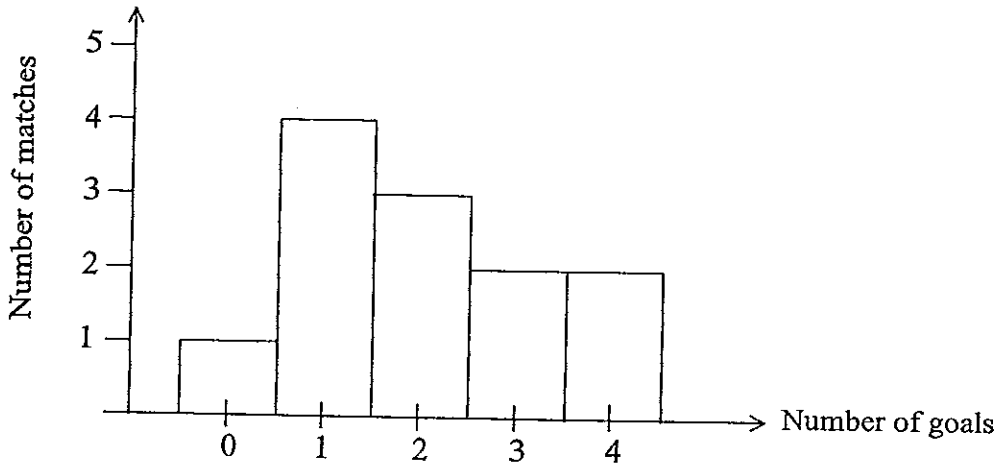
6. The histogram graph below shows the number of goals scored by the Dazzlers in a series of soccer matches.



Find the median number of goals scored in this series.

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7. The square $\square$ represents a missing digit in the stem and leaf plot.
Given that the median is equal to the range, what does $\square$ represent?

3	2
5	5 8
6	$\square$ 9
8	7
9	5

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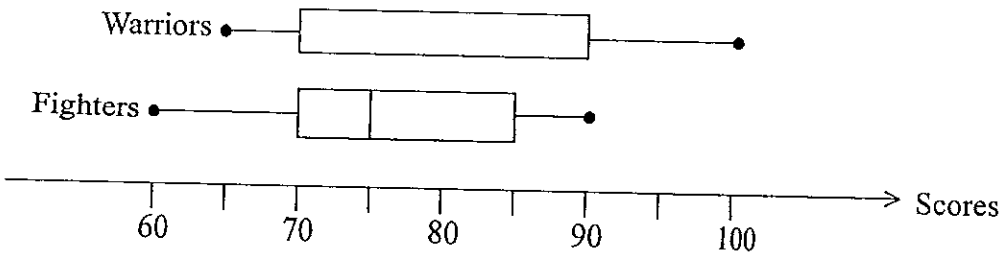
8. The box and whisker plot represents the points scored by the Warriors and Fighters basketball teams in 20 matches played in a particular season.



If the Warriors' median is 10 more than the median of the Fighters, complete the graph for the Warriors.

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9. In Sam's Chess Club there are more than 11 students. All are born in the same year but none of them in the same month.
If one of them is chosen at random, what is the probability that the person chosen is not born in a month that starts with 'J'?

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10. In a game of chance, Mark is to open a safe containing a major prize in a maximum of two attempts.

In his first attempt he is to use a key chosen from 4 available keys. In the second attempt, if it is needed, he can use any of the remaining keys.

What is the probability that Mark will win on his second attempt?

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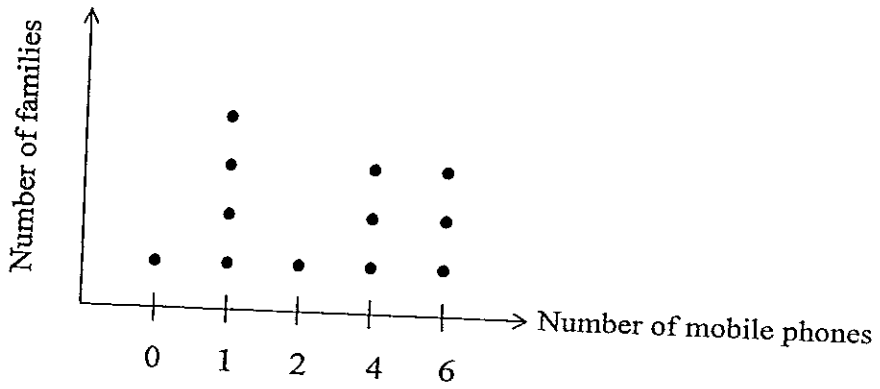
11. In this frequency distribution the median is three less than the mode and three more than the lowest score.

Find the range of these scores.

Score	Frequency
x	3
7	2
9	1
y	4

QUESTION 12 (3 marks)

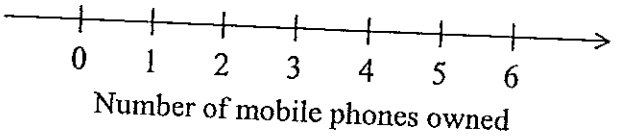
The dot plot below shows the number of mobile phones owned by 12 families.



a) Find the average number of mobile phones used by these families.

b) If one of these families is chosen at random, what is the probability that the number of mobile phones owned by this family is greater than the modal number of mobile phones owned?

c) Draw in the space below a box and whisker plot for the above data.



QUESTION 13 (3 marks)

Amanda's Year 7 class performed poorly in their first algebra test. After further practice and revision the class sat for another test.

To compare the results of these two tests Amanda recorded the students' marks as percentages in the stem and leaf plot below.

Second Test LEAF	Stem	First Test LEAF
	2	5 6 6 7
	3	4 5 7 8 8
8 6 5	4	2 4 5 7 9
8 6 4 2 0 0 0	5	6 8 9
8 6 4	6	2 2 3 3
8 8 5 2	7	0 1 5
8 4 2 0	8	
8 6 4	9	

a) What is the difference between the averages of the two tests?

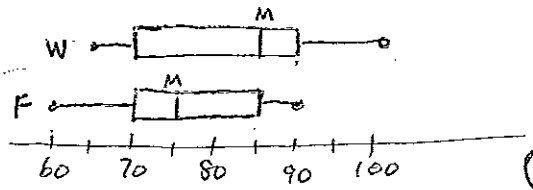
b) What is the difference in the interquartile ranges of the two tests?

c) If one student from the class is chosen at random, what is the probability that his or her mark in the second test was higher than the mean of the class in that test ?

SOLUTIONS – ADVANCED Chance & Data – YEAR 10

(1) B (2) D (3) B (4) A (5) $6 (6) 2 (7) □ = 63 (8)

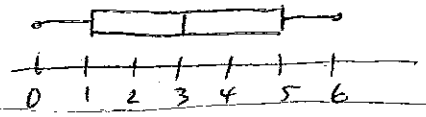
(8)



(9) $\frac{9}{12} = \frac{3}{4}$ (10) $\frac{3}{4} \times \frac{1}{3} = \frac{1}{4}$ (11) Range = $y - x$
Mode = y
Median = $\frac{7+9}{2} = 8$
$\therefore 8 = y - 3 \rightarrow y = 11$
$8 = x + 3 \rightarrow x = 5$

(12) a) $\bar{x} = \frac{36}{12} = 3$ b) $\frac{7}{12}$

c)



(13) a) 1ST $\bar{x} = 48$
2ND $\bar{x} = 68$
} Difference = 20%

b)

Test 1	Test 2	Difference
I.Q.R. $= Q_3 - Q_1$	I.Q.R. $= Q_3 - Q_1$	$= 4$
$= 62 - 36$	$= 81 - 51$	
$= 26$	$= 30$	

c) $\frac{11}{24}$