Chance and data practice

Skill 9.1 Bar graphs and frequency polygons

These numbers are my team's goal scores for the competition:
{28, 31, 49, 58, 62, 84, 21, 22, 23, 25, 31, 32, 30, 42, 41, 68, 81, 82, 58, 59, 27, 38, 40, 41, 58, 57, 48, 29}

1 Divide the data into the following whole number groups:

(1 to 9), (10 to 19), (20 to 29), (30 to 39), (40 to 49), (50 to 59), (60 to 69), (70 to 79), (80 to 89)

2 Draw a bar graph and mark on the frequency polygon.

Skill 9.2 Pie graphs

Joanne has an extensive orchid collection. Make a pie graph to display this information about the collection:

Orchid colour	Number
Red	12
Yellow	12
Brown	6
Green	8
White	10

Skill 9.3 Stem and leaf plots

Set up a stem and leaf plot for this information and use it to find the median value of the data set:
{29, 33, 33, 69, 69, 41, 74, 79, 20, 21, 56, 58, 60, 62, 76, 78, 48, 48, 22, 27, 40, 72, 57, 39, 35, 25, 20, 48, 59}

Skill 9.4 Measures of central tendency

From the data set determine:

1 Mean   2 Median   3 Mode
{1, 18, 20, 2, 4, 2, 2, 5, 8, 5, 5, 1, 1, 16, 1, 5, 1, 5, 19, 19}

Skill 9.5 Measures of spread

From the data set determine the:

1 Mean

2 Range

3 Standard deviation
Data set: {6, 7, 8, 9, 10, 5, 11}

Skill 9.6 Interquartile range

Find the median and interquartile range these two data sets:

1 {1, 2, 6, 7, 9, 10, 12, 17}

2 {2, 8, 9, 10, 12, 13, 17, 18, 21}

Skill 9.7 Displaying continuous data

These are the measurements, in metres, of young pine trees in a plantation.
{1.2, 1.1, 1.7, 3.8, 2.1, 2.2, 1.8, 1.7, 1.4, 1.4, 1.3, 2.8, 2.7, 3.1, 3, 1.3, 1.2, 1.1, 1.6, 1.7, 2.1, 2.4, 2.6, 2.7, 1.3, 1.4, 1.7, 2.3, 2, 2.1, 1.6, 1.7}

1 Divide the data into the following groups:
(1 to <1.5), (1.5 to <2), (2 to <2.5), (2.5 to <3), (3 to <3.5), (3.5 to <4)

2 Draw a bar graph.

Skill 9.8 Working with continuous data

1 Divide the data into the following groups:

(1 to <2), (2 to <3), (3 to <4), (4 to <5)

Data set:

{2.04, 2.11, 1.78, 1.001, 4.02, 4.13, 3.007, 3.7094, 2.6, 2.083, 1.79, 1.832, 2.043, 3.098, 3.110, 3.1897, 4.72, 4.083, 1.093, 1.928, 1.853, 3.33, 3.218, 4.6789, 1.198, 1.2, 3.8765, 4, 4.0938, 1.2}

2 Use the continuous data procedure to find the mean.

## Skill 9.9 Probability of single and complementary events

1 List the probability distributions for the following spinners:

(a)   (b)
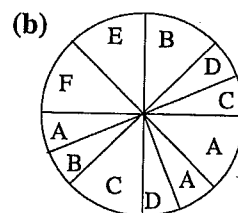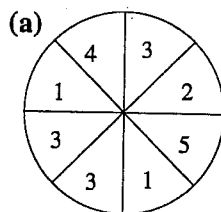
2 Joan has a bag of tokens with the following numbers on them:

{1, 2, 1, 3, 1, 4, 5, 8, 9, 10, 3, 4}

(a) Find the probability of choosing a token with a number less than 5

(b) Describe the event which is complementary to this and find its probability.

Skill 9.10 Displaying sample spaces

A die is made from this net:

	5	
3	8	7
	6	
	9	
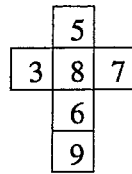
A fair coin is tossed and the die is tossed.
Show the sample space using

1 a tree diagram, and
2 a lattice diagram

Skill 9.11 Probability of multiple events

Using the event described in Skill 9.10 above find the probability of:

1 tossing a head and rolling a number greater than 6
2 tossing a tail and rolling a number divisible by 3
3 tossing a tail
4 tossing a tail and rolling an odd number
5 tossing a head and rolling an even number

Skill 9.12 Probability and gambling odds
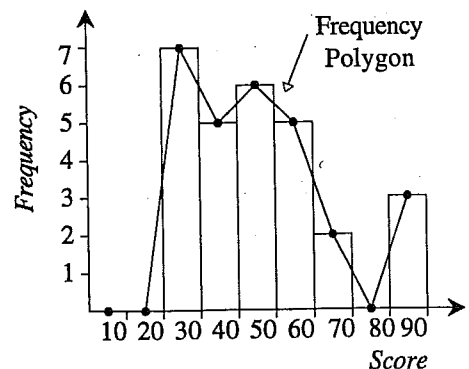
1 Find the probability of horses winning with odds of:

   (a) 4:1   (b) 8:3   (c) 7:4   (d) 2:3

2 Find the expected pay out for the following bets with odds of:

   (a) $3 bet, odds 6:1
   (b) $7 bet, odds 2:1
   (c) $8 bet, odds 2:5
   (d) $10 bet, odds 1:3
   (e) $100 bet, odds 14:1

Answers

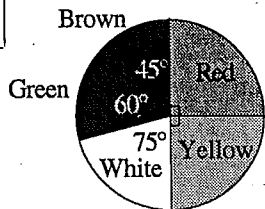## 9 Chance and data

Skill 9.1

Score Range	Tally	Frequency
1 to 9		0
10 to 19		0
20 to 29	ⅢⅡ	7
30 to 39	Ⅲ	5
40 to 49	ⅢⅠ	6
50 to 59	Ⅲ	5
60 to 69	ⅠⅠ	2
70 to 79		0
80 to 89	ⅠⅠⅠ	3

Skill 9.2

Colour	Number	Angle
Red	12	$\frac{12}{48} \times 360° = 90°$
Yellow	12	$\frac{12}{48} \times 360° = 90°$
Brown	6	$\frac{6}{48} \times 360° = 45°$
Green	8	$\frac{8}{48} \times 360° = 60°$
White	10	$\frac{10}{48} \times 360° = 75°$
Total	48	

Skill 9.3

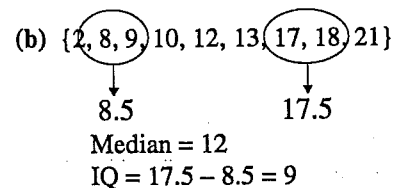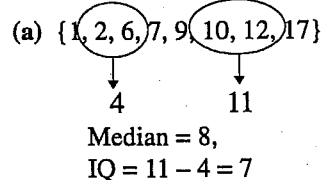| Stem	Leaf
2	0, 0, 1, 2, 5, 7, 9
3	3, 3, 5, 9
4	0, 1, 8, 8, 8
5	6, 7, 8, 9
6	0, 2, 9, 9
7	2, 4, 6, 8, 9

Median = 48

Skill 9.4

1 Mean = 7   2 Median = 5
3 Mode = 1, 5

Skill 9.5

1 Mean = 8   2 Range = 6
3 Standard Deviation = 2.16

Skill 9.6

(a) {1, 2, 6, 7, 9, 10, 12, 17}

4   11

Median = 8,
IQ = 11 − 4 = 7

(b) {2, 8, 9, 10, 12, 13, 17, 18, 21}

8.5   17.5

Median = 12
IQ = 17.5 − 8.5 = 9

Skill 9.7

Data Range	Tally	Frequency
1 to <1.5	IIII IIII	10
1.5 to <2	IIII III	8
2 to <2.5	IIII II	7
2.5 to <3	IIII	4
3 to <3.5	II	2
3.5 to <4	I	1

Survey of pine trees

Skill 9.8

Group Range	Tally	Frequency	Middle of group	Freq. × Middle of group
1 to <2	IIII IIII	10	1.5	15
2 to <3	IIII	5	2.5	12.5
3 to <4	IIII III	8	3.5	28
4 to <5	IIII II	7	4.5	31.5
	Total	30	Total	87

Mean = 87 ÷ 30 = 2.9

Skill 9.9

1 (a)

Number	Probability
1	$\frac{1}{4}$
2	$\frac{1}{8}$
3	$\frac{3}{8}$
4	$\frac{1}{8}$
5	$\frac{1}{8}$

(b)

Letter	Probability
A	$\frac{1}{4}$
B	$\frac{3}{16}$
C	$\frac{3}{16}$
D	$\frac{1}{8}$
E	$\frac{1}{8}$
F	$\frac{1}{8}$

2 (a) $\frac{8}{12} = \frac{2}{3}$

(b) Choosing a token greater than or equal to five

$\frac{4}{12} = \frac{1}{3}$

Skill 9.10

1

2

Skill 9.11
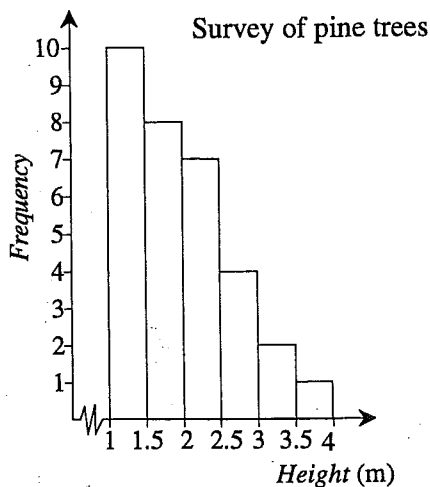
1 $\frac{3}{12} = \frac{1}{4}$ 2 $\frac{3}{12} = \frac{1}{4}$ 3 $\frac{1}{2}$

4 $\frac{4}{12} = \frac{1}{3}$ 5 $\frac{2}{12} = \frac{1}{6}$

Skill 9.12

1 (a) $\frac{1}{5}$ (b) $\frac{3}{11}$ (c) $\frac{4}{11}$ (d) $\frac{3}{5}$

2 (a) $21   (b) $21   (c) $11.20 (d) $13.33

(e) $1500