



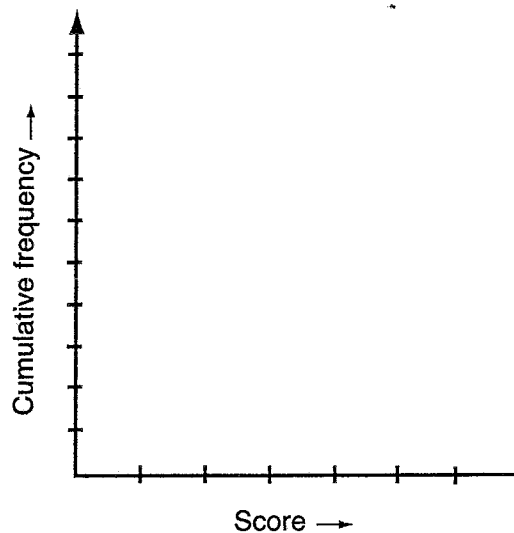
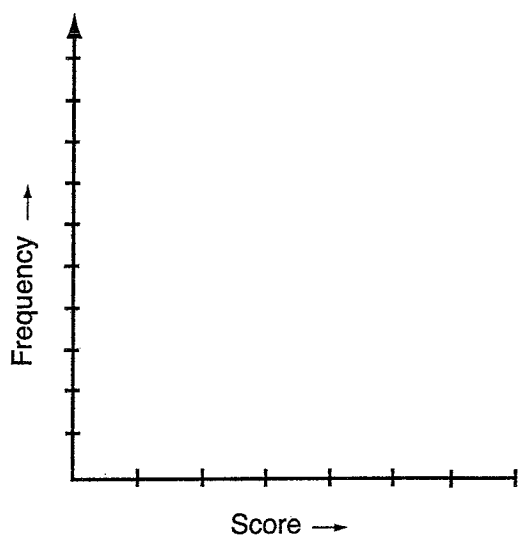
UNIT 6: Review of statistics

QUESTION 1 Fifty families were surveyed to find how many children each family has and the following set of data was obtained.

5 3 2 4 1 5 0 2 3 2 2 1 1 3 3
 4 1 3 2 1 3 3 2 2 2 3 2 1 3 1
 2 3 0 1 1 5 3 4 5 0 3 0 2 0 2
 2 1 5 4 3

- Complete the frequency distribution table.
- Draw a frequency histogram.
- Draw a frequency polygon.
- Draw a cumulative frequency histogram.
- Draw a cumulative frequency polygon.

Score (x)	Tally	Frequency (f)	Cumulative frequency
0			
1			
2			
3			
4			
5			
		$\Sigma f =$	



QUESTION 2 For the frequency distribution given above, calculate:

- the mean _____
- the mode _____
- the range _____
- the median _____
- the relative frequency _____

Probability and statistics



UNIT 7: Measures of spread, standard deviation

QUESTION 1 Use your calculator to find the mean and standard deviation, correct to one decimal place, for the following sets of scores. Also find the range of each set of scores.

a 2, 4, 8, 9, 10

b 1, 2, 3, 4, 5, 6, 7

c 7, 11, 12, 13, 14, 15, 16, 17, 18

d 35, 46, 48, 40, 36, 41, 42, 37

e 8, 3, 7, 3, 9, 5, 8, 8, 6, 9, 3, 6, 2, 3

f 5, 8, 10, 15, 15, 10, 8, 9, 18, 20, 18, 15, 10, 15

g

Score	5	7	9	11	13	15
Frequency	8	5	7	8	3	6

h

Score	10	20	30	40	50	60	70
Frequency	3	4	3	2	5	2	3

QUESTION 2 Five students sat for a mathematics test and a science test. Their marks are given below.

Science	56	60	69	59	65
Mathematics	70	75	86	82	80

a Find the mean and standard deviation for each set of scores.

b Michael scored 69 in science and 86 in mathematics. Which was the better average mark?

c If Matthew scored 65 in science and 80 in mathematics, in which subject did Matthew perform better compared with the class average?

d Use your calculator to find the standard deviation and the mean for each test.

Test A	8	10	13	13	14	15	16	18	16	17	_____
Test B	3	11	15	15	9	10	7	16	16	19	_____

For which test would the result 16 be better compared with the class average?

Probability and statistics



UNIT 8: Measures of spread, interquartile range

QUESTION 1 For the following set of scores, 2, 3, 3, 4, 5, 7, 9, 9, 10, 11, 12, 12, find:

a the 1st quartile (Q1) b the 2nd quartile (Q2) – (the median)

c the 3rd quartile (Q3) d the interquartile range

QUESTION 2 Complete the cumulative frequency table and draw a cumulative frequency histogram from the completed table.

Score	55	56	57	58	59	60	61	62	63
Frequency	1	2	4	6	7	12	8	5	3
Cumulative frequency									

From the graph find:

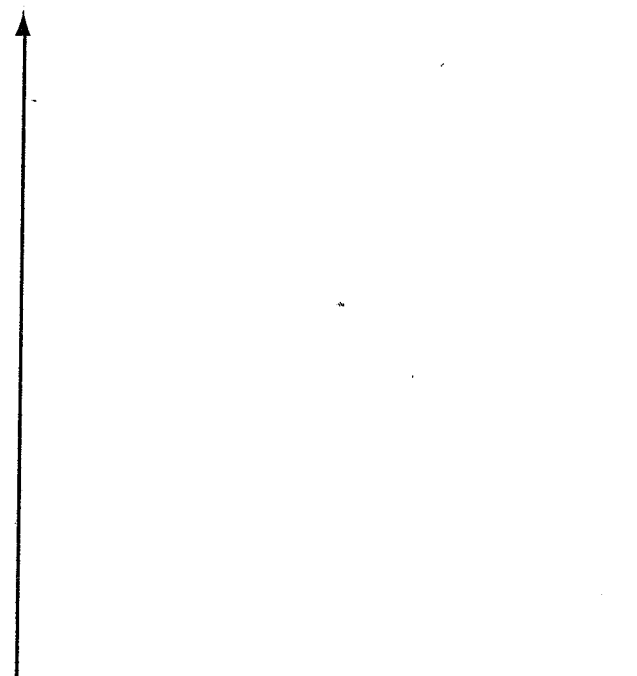
a the median

b the lower quartile

c the 80th percentile

d the interquartile range

e the mode



QUESTION 3 Find the interquartile range of the following sets of scores.

a 5, 2, 3, 6, 8, 9, 6, 8

b 8, 10, 12, 10, 12, 11, 13, 12, 10, 12, 10, 12, 10, 11, 13, 14, 13, 12, 10, 11

Probability and statistics

Instructions for SECTION 1

- You have 15 minutes to answer Section 1
- Each question is worth 2 marks
- Attempt ALL questions
- Calculators are NOT to be used
- Fill in only ONE CIRCLE for each question

- 1 From a pack of 52 cards, one card is drawn at random. Find the probability of drawing a diamond.
 (A) $\frac{1}{13}$ (B) $\frac{2}{13}$ (C) $\frac{1}{4}$ (D) $\frac{3}{4}$
- 2 In a single throw of one die, find the probability of throwing an odd number.
 (A) $\frac{1}{6}$ (B) $\frac{1}{3}$ (C) $\frac{1}{2}$ (D) $\frac{2}{3}$
- 3 In a single throw of two dice, find the probability of throwing a double.
 (A) $\frac{1}{6}$ (B) $\frac{2}{3}$ (C) $\frac{1}{2}$ (D) $\frac{3}{4}$
- 4 For the set of scores, 5, 8, 3, 1, 9, 5, 6, 7, find the range.
 (A) 6 (B) 7 (C) 8 (D) 9
- 5 For the set of scores, 10, 20, 50, 10, 60, what is the difference between the mean and the mode?
 (A) 10 (B) 20 (C) 30 (D) 40
- 6 The test marks of 10 students are 5, 9, 5, 7, 3, 7, 8, 7, 9, 7. What is the modal mark?
 (A) 6 (B) 7 (C) 8 (D) 9
- 7 For the following set of scores, 3, 1, 4, 6, 5, 5, 7, 3, 4, 5, 4, 5, 7, the mode is
 (A) 6 (B) 4.538 (C) 5 (D) 4
- 8 Find the range of the set of scores 8, 9, 12, 7, 9, 11, 8, 9, 5, 13, 7, 9.
 (A) 7 (B) 9 (C) 4 (D) 8
- 9 The median of the numbers 6, 4, 9, 7, 4, 2, 8, is
 (A) 8 (B) 6 (C) 5 (D) 4
- 10 The mean of the numbers 8, 10 and x is the same as the mean of the numbers 6, 8, 10 and 12. Find the value of x .
 (A) 6 (B) 9 (C) 10 (D) 12

Total marks achieved for SECTION 1

Probability and statistics

Instructions for SECTION 2

- You have 20 minutes to answer ALL of Section 2
- Each question is worth 2 marks
- Attempt ALL questions
- Calculators may be used

Questions	Answers	Mar
<p>A bag contains 3 yellow, 2 blue and 4 white balls. If a ball is drawn at random, find the probability that it is:</p> <p>1 yellow.</p> <p>2 blue.</p> <p>3 not white.</p>	<p>_____</p> <p>_____</p> <p>_____</p>	<p>2</p> <p>2</p> <p>2</p>
<p>A coin is tossed three times and the results noted. Use a tree diagram to find the probability of:</p> <p>4 three tails.</p> <p>5 two tails and one head in any order.</p> <p>6 at least one tail.</p>	<p>_____</p> <p>_____</p> <p>_____</p>	<p>2</p> <p>2</p> <p>2</p>
<p>A pair of dice is rolled simultaneously. Find the probability of getting:</p> <p>7 a double five.</p> <p>8 any double.</p> <p>9 a score greater than 9.</p> <p>10 at least one six on the uppermost face of a die.</p> <p>11 the sum of the two numbers rolled being 11.</p> <p>12 two even numbers.</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>2</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p>
<p>Use your calculator to find the mean and standard deviation, correct to one decimal place, for the following sets of scores.</p> <p>13 8, 9, 6, 9, 7, 6, 6</p> <p>14 12, 14, 9, 6, 1, 12</p> <p>15 25, 33, 26, 56, 44, 41, 33, 25</p>	<p>_____</p> <p>_____</p> <p>_____</p>	<p>2</p> <p>2</p> <p>2</p>

Total marks achieved for SECTION 2

Answers

PAGE 35 1 a 361.6 cm^3 b 174.1 cm^3 2 a 306 cm^3 b 2.33 m^3 3 a 216.2 cm^3 b 776.8 cm^3 4 a 396.8 cm^3 b 285.6 m^3

PAGE 36 1 a 121.5 cm^3 b 1838.6 cm^3 2 a 88.22 m^3 b 144.76 m^3 3 a 1005.3 cm^3 b 55.9 cm^3 c 4712.4 cm^3 4 a 20910.4 cm^3 b 1392.8

PAGE 37 1 a 3053.6 cm^3 b 4188.8 cm^3 c 113097.3 cm^3 d 22449.3 cm^3 e 15002.5 cm^3 f 91952.3 cm^3 2 a 4188.8 cm^3 b 150532.6
3 a 1526.8 cm^3 b 15529.7 cm^3 4 a 10576.70 cm^3 b 753.98 cm^3

PAGE 38 1 a $5.1472 \times 10^8 \text{ km}^2$ b $1.098 \times 10^{12} \text{ km}^3$ 2 a 261.3 m^2 b 397.18 m^3 3 61.26 m^2 4 a 377 cm^3 b 377 mL 5 a $\$14 \text{ C}$
b 375 kL

PAGE 39 1 B 2 C 3 C 4 B 5 C 6 D 7 B 8 C 9 B 10 C

PAGE 40 1 208 cm^2 2 192 cm^3 3 172 cm^2 4 120 cm^3 5 $672\pi \text{ cm}^2$ 6 $1960\pi \text{ cm}^3$ 7 360 cm^2 8 400 cm^3 9 $96\pi \text{ cm}^2$ 10 $96\pi \text{ cm}^3$
11 $324\pi \text{ cm}^2$ 12 $972\pi \text{ cm}^3$ 13 $147\pi \text{ cm}^2$ 14 $\frac{686\pi}{3} \text{ cm}^3$ 15 $784\pi \text{ cm}^2$

PAGE 41 1 a $\frac{1}{4}$ b $\frac{1}{2}$ c $\frac{1}{13}$ d $\frac{3}{4}$ e $\frac{1}{26}$ f $\frac{1}{2}$ 2 a $\frac{1}{3}$ b $\frac{2}{3}$ c $\frac{1}{3}$ 3 a $\frac{1}{6}$ b $\frac{1}{2}$ c $\frac{2}{3}$ d 0 e $\frac{1}{2}$ f $\frac{1}{3}$ 4 a $\frac{2}{5}$ b
c $\frac{4}{15}$ d $\frac{3}{5}$ e 0 f $\frac{3}{5}$ 5 a 0 b 1 c $\frac{1}{3}$ d 1 e $\frac{1}{3}$ f 1 6 a $\frac{4}{7}$ b $\frac{3}{7}$ c $\frac{1}{7}$ d 0 e $\frac{4}{7}$ f $\frac{2}{7}$ 7 a $\frac{4}{11}$ b $\frac{7}{11}$ c $\frac{2}{11}$ d
e 0 f $\frac{1}{11}$

PAGE 42 1 a $\frac{1}{8}$ b $\frac{3}{8}$ c $\frac{7}{8}$ 2 a 12 b $\frac{2}{3}$ c $\frac{1}{3}$ d $\frac{7}{12}$ 3 a $\frac{3}{10}$ b $\frac{1}{10}$ c $\frac{3}{5}$ 4 a $\frac{1}{8}$ b $\frac{3}{8}$ c $\frac{3}{8}$ d $\frac{1}{2}$ e $\frac{1}{2}$ f

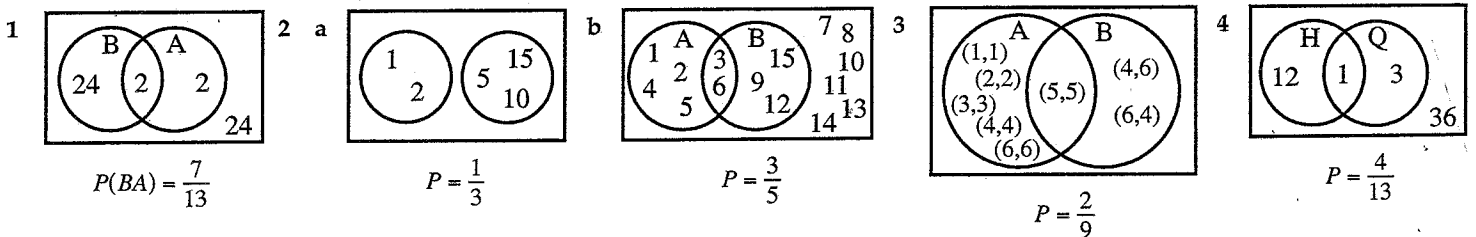
PAGE 43 1 a $\frac{5}{18}$ b $\frac{5}{18}$ c $\frac{1}{6}$ d $\frac{5}{18}$ e $\frac{5}{9}$ 2 $\frac{4}{25}$ 3 a $\frac{3}{20}$ b $\frac{51}{380}$ c $\frac{3}{190}$ d $\frac{68}{95}$ e $\frac{27}{95}$ f $\frac{51}{190}$ 4 a $\frac{5}{11}$ b $\frac{3}{11}$

PAGE 44 1 a

1,1	2,1	3,1	4,1	5,1	6,1
1,2	2,2	3,2	4,2	5,2	6,2
1,3	2,3	3,3	4,3	5,3	6,3
1,4	3,4	3,4	4,4	5,4	6,4
1,5	2,5	3,5	4,5	5,5	6,5
1,6	2,6	3,6	4,6	5,6	6,6

 2 a $\frac{1}{36}$ b $\frac{1}{6}$ c $\frac{1}{9}$ d $\frac{1}{12}$ e $\frac{1}{12}$ f $\frac{1}{6}$ g $\frac{1}{6}$ h $\frac{1}{4}$ i $\frac{1}{12}$ j $\frac{11}{32}$ k
3 rolling one die 4 $\frac{1}{4}$ 5 $\frac{1}{4}$ 6 rolling one die

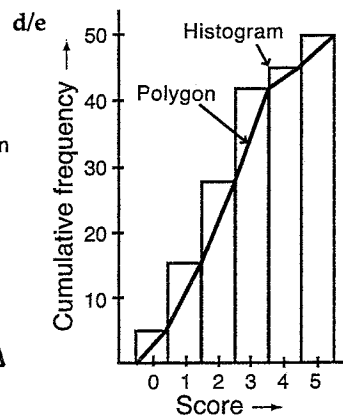
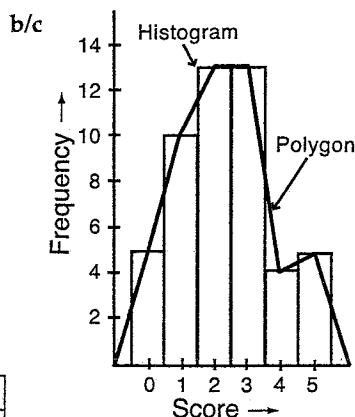
PAGE 45



PAGE 46

1 a

x	Tally	f	c.f.
0		5	5
1		10	15
2		13	28
3		13	41
4		4	45
5		5	50



2 a 2.32 b 2 and 3 c 5 d 2

e

Score	0	1	2	3	4	5
Relative f	0.1	0.2	0.26	0.26	0.08	0.1

Answers

PAGE 47 1 a $\bar{x} = 6.6$, SD = 3.07, range = 8 b $\bar{x} = 4$, SD = 2, range = 6 c $\bar{x} = 13.67$, SD = 3.20, range = 11 d $\bar{x} = 40.63$, SD = 4.36, range = 13
 e $\bar{x} = 5.71$, SD = 2.43, range = 7 f $\bar{x} = 12.57$, SD = 4.39, range = 15 g $\bar{x} = 9.59$, SD = 3.41, range = 10 h $\bar{x} = 39.1$, SD = 19.75, range = 60
 2 a Science: $\bar{x} = 61.8$, SD = 4.62; Mathematics: $\bar{x} = 78.6$, SD = 5.57 b Science c Science d Test A: $\bar{x} = 14$, SD = 2.97; Test B: $\bar{x} = 12.1$, SD = 4.68
 The result is better for Test B.

PAGE 48 1 a 3.5 b 8 c 10.5 d 7 2 a 60 b 58 c 61 d 3 e 60
 3 a 4 b 2

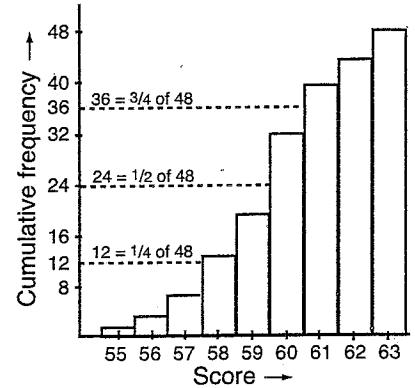
PAGE 49 1 C 2 C 3 A 4 C 5 B 6 B 7 C 8 D 9 B 10 B

PAGE 50 1 $\frac{1}{3}$ 2 $\frac{2}{9}$ 3 $\frac{5}{9}$ 4 $\frac{1}{8}$ 5 $\frac{3}{8}$ 6 $\frac{7}{8}$ 7 $\frac{1}{36}$ 8 $\frac{1}{6}$

9 $\frac{1}{6}$ 10 $\frac{11}{36}$ 11 $\frac{1}{18}$ 12 $\frac{1}{4}$ 13 $\bar{x} = 7.29$, SD = 1.28

14 $\bar{x} = 9$, SD = 4.40 15 $\bar{x} = 35.375$, SD = 10.28

x	f	$c.f.$
55	1	1
56	2	3
57	4	7
58	6	13
59	7	20
60	12	32
61	8	40
62	5	45
63	3	48



PAGE 51 1 a AB and EF, AD and EH, DC and HG, BC and FG b AB and DE, BC and EF, AC and DF c AB and EF, BC and FG, CD and GH, DA and HE 2 a $\frac{AB}{EF} = \frac{AD}{EH} = \frac{DC}{HG} = \frac{BC}{FG}$ b $\frac{AB}{EF} = \frac{BC}{FG} = \frac{CD}{GH} = \frac{DA}{HE}$ c $\frac{PQ}{LM} = \frac{QR}{MN} = \frac{RS}{NO} = \frac{SP}{OL}$ 3 a $\frac{x}{4} = \frac{4}{2}$, $x = 8$; $\frac{y}{5} = \frac{4}{2}$, $y = 10$

b $\frac{12}{12+x} = \frac{9}{12}$, $x = 4$; $\frac{y}{y+5} = \frac{9}{12}$, $y = 15$ c $\frac{x}{10} = \frac{10}{4}$, $x = 25$; $\frac{y}{8} = \frac{10}{4}$, $y = 20$

PAGE 52 1 a AB and DE, BC and EF, AC and DF b $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$ c $x = 6$, $y = 15$ 2 a AB and CD, BE and CE, AE and DE

b $\frac{AB}{CD} = \frac{BE}{CE} = \frac{AE}{DE}$ c $x = 4$, $y = 10$ 3 a AD and AB, AE and AC, DE and BC b $\frac{AD}{AB} = \frac{AE}{AC} = \frac{DE}{BC}$ c $x = 45$, $y = 6$ 4 a AB and DE, BC and DC

AC and EC b $\frac{AB}{DE} = \frac{BC}{DC} = \frac{AC}{EC}$ c $x = 15$, $y = 16$ 5 a AB and DE, BC and EF, AC and DF b $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$ c $x = 9$, $y = 15$ 6 a AB and

DE, BC and EF, AC and DF b $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$ c $x = 24$, $y = 65$ 7 a PQ and TR, QR and RS, PR and TS b $\frac{PQ}{TR} = \frac{QR}{RS} = \frac{PR}{TS}$ c $x = 21$, $y = 6$

8 a LM and QN, MN and NP, LN and QP b $\frac{LM}{QN} = \frac{MN}{NP} = \frac{LN}{QP}$ c $x = 24$, $y = 35$ 9 a AB and ED, BC and DC, AC and EC b $\frac{AB}{ED} = \frac{BC}{DC} = \frac{AC}{EC}$

c $x = 52\frac{1}{2}$, $y = 6$

PAGE 53 1 a Sides in the same ratios, $m = 20^\circ$ b Two pairs of sides in the same ratio and the included angles equal, $y = 10$ c equiangular; $x = 7$, $y = 10$ d equiangular; $x = 2$, $y = 14$ e equiangular; $x = 3$, $y = 8$ f equiangular; $x = 6$, $y = 25$ 2 a $x = 40$, $y = 8$ b $x = 15$, $y = 12$ c $x = 9$, $y = 21$

PAGE 54 1 a $\frac{25}{64}$ b $\frac{9}{25}$ c $\frac{9}{25}$ 2 a $22\frac{6}{7}$ cm² b $3\frac{3}{8}$ cm² c $348\frac{4}{9}$ cm² 3 a 4 times b 3:1 c Always similar d 4:9

PAGE 55 1 a $\frac{8}{27}$ b $\frac{1}{8}$ c $\frac{8}{125}$ 2 a 31 cm³ b 12.97 cm³ c 5.1 cm³ 3 a 125:64 b i 8:7 ii 512:343 c 544 cm³

PAGE 56 1 a i AB and DE, BC and EF, AC and DF ii $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$ iii $x = 8$, $y = 15$ b i AD and AB, DE and BC, AE and AC

ii $\frac{AD}{AB} = \frac{DE}{BC} = \frac{AE}{AC}$ iii $x = 3$, $y = 15$ c i AB and CD, BE and CE, AE and DE ii $\frac{AB}{CD} = \frac{BE}{CE} = \frac{AE}{DE}$ iii $x = 6$, $y = 20$ 2 a $x = 9$, $y = 35$

b $x = 25$, $y = 12$ c $x = 12$, $y = 12$ 3 a 4:25 b 8:125 4 a 3:7 b 9:343

PAGE 57 1 D 2 C 3 B 4 C 5 B 6 C 7 B 8 B 9 A 10 D

PAGE 58 1 2:5 2 4:25 3 8:125 4 AB and DE, BC and EF, AC and DF 5 $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$ 6 $x = 6$, $y = 6$ 7 AB and CD, AE and DE,

BE and CE 8 $\frac{AB}{CD} = \frac{BE}{CE} = \frac{AE}{DE}$ 9 $x = 8$, $y = 12$ 10 Four times 11 Always similar 12 4:25 13 3:4 14 2:5 15 8:125

PAGE 59 1 a 0.966 b 0.675 c -0.5 d 2.156 e -0.269 f 0.336 2 a 30° b $43^\circ 11'$ c $69^\circ 46'$ d $27^\circ 7'$ e $53^\circ 40'$ f 15°

3 a $\sin \theta = \frac{4}{5}$, $\cos \theta = \frac{3}{5}$, $\tan \theta = \frac{4}{3}$ b $\sin \theta = \frac{5}{13}$, $\cos \theta = \frac{12}{13}$, $\tan \theta = \frac{5}{12}$ c $\sin \theta = \frac{15}{17}$, $\cos \theta = \frac{8}{17}$, $\tan \theta = \frac{15}{8}$ 4 a 29.5 cm b 12.3 cm c 21.7 cm