Carlingford High School

Mathematics

Year 10 Term 3 Examination

5.1 Course

2014

Name: _____

Teacher: _____

Time allowed: 55 minutes

- Board approved calculators may be used.
- Show all necessary working.
- Marks may be deducted for careless or untidy work.
- Complete the examination in blue or black pen.
- All diagrams are **NOT** drawn to scale

Topic	Statistics	Trigonometry	Congruence and Similarity		Total
Mark	/20	/20	/20		/60

Statistics (20 Marks)	Marks
1. For the following scores find: 7, 3, 4, 4, 2, 9, 2, 4 a) Mean: b) Mode: c) Median: d) Range:	4
2. The following are scores for a quick quiz: 7, 12, 9, 12, 7, 8, 10, 9, 11, 10, 9, 8, 11 9, 10, 10, 12, 11, 11, 8, 11, 9, 11, 8, 11 a) Complete the table below	10

Score x	Tally	Frequency f	Cumulative Frequency	$f \times x$

b) Find the:

(i) Mean

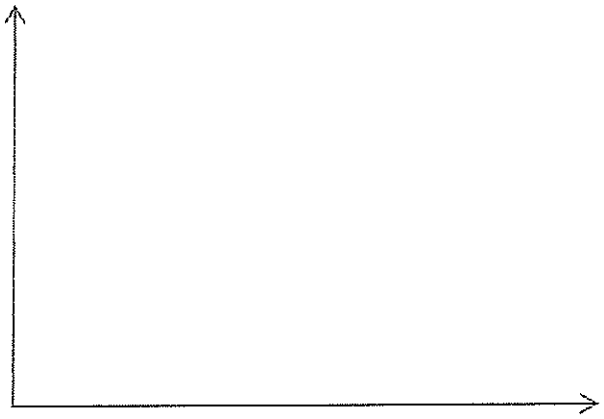
(ii) Mode

(iii) Median

(iv) Range

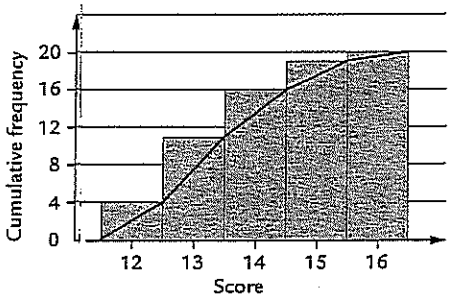
c) What percentage of scores are less than 10?

d) Construct a frequency histogram for the table on page 1



3. For the cumulative frequency histogram/polygon below

4



a) Find the median

b) Complete the table:

Score	Frequency

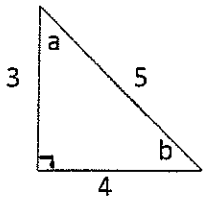
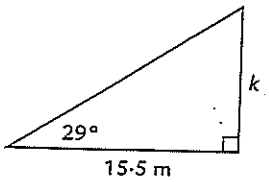
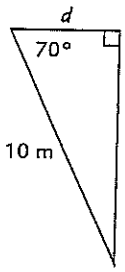
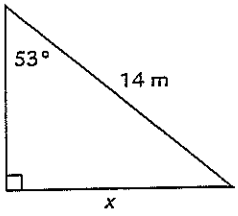
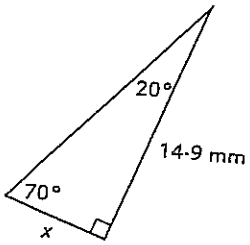
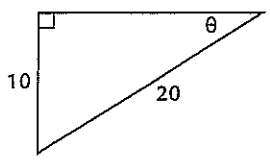
c) How many scores were there?

4. a) Complete the table

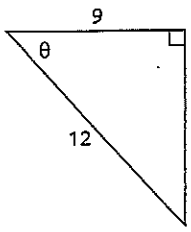
2

Class	Class Centre	Frequency
11-15		8
16-20		7
21-25		5

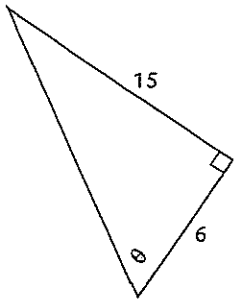
b) What is the modal class?

Trigonometry (20 Marks)	Marks
1.  sin a = tan a = cos b = tan b =	4
2. Find the pronumeral to one decimal place: a)  b)  c)  d) 	8
3. Find θ to the nearest degree: a) 	6

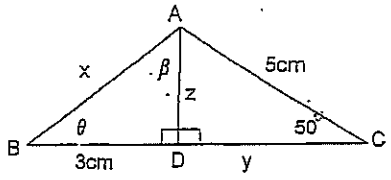
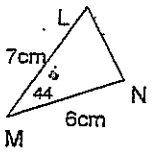
b)



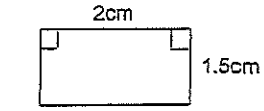
c)



5. A ladder 9m long leans against a wall. If it makes an angle of 28^{o} with the wall, how far up the wall does it reach? Give your answer to the nearest m. — 2

Congruence and Similarity (20 Marks)	Marks
1.  Given that $\Delta ABD \equiv \Delta ACD$ find:- $x =$_____ $y =$_____ $z =$_____ $\theta =$_____ $\beta =$_____	5
2. Using a ruler, protractor and pencil accurately construct ΔLMN with side LM = 7 cm MN = 6 cm and $\angle LMN = 44^0$ in the space below. **Clearly label the triangle LMN.** 	2
3. Write **True** or **False**. Similar figures :- (a) are the same size. _____ (b) are the same shape _____ (c) have matching angles equal _____ (d) have matching sides equal _____	4

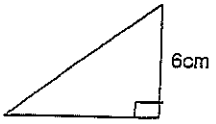
4. (a)Using an enlargement factor of 3 accurately make a drawing of this rectangle



NOT TO SCALE

(b) Using a scale factor of $\frac{2}{3}$ make a copy of this triangle

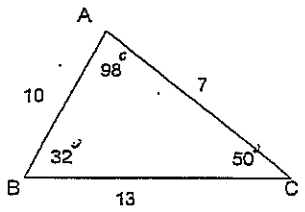
NOT TO SCALE

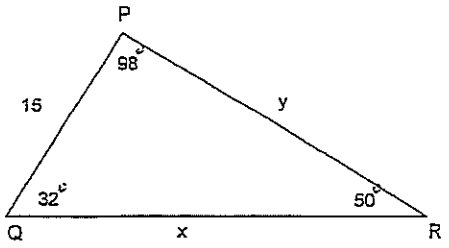


4

5.

NOT DRAWN TO SCALE





These triangles are not drawn to scale.

(a) Explain why the triangles must be similar .

_____

_____

(b) Which side in ΔPQR matches side AB? _____

(c) What is the scale factor used to form the similar triangles? _____

(d) Use the scale factor to calculate the length of :-

Side x = _____

Side y = _____

5

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Mathematics

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2014

Name: Solutions

Teacher: _____

Time allowed: 55 minutes

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Topic	Statistics	Trigonometry	Congruence and Similarity		Total
Mark	/20	/20	/20		/60

Statistics (20 Marks)	Marks
1. For the following scores find: 7, 3, 4, 4, 2, 9, 2, 4 a) Mean: $4\frac{3}{8}$ b) Mode: 4 c) Median: 4 d) Range: 7	4
2. The following are scores for a quick quiz: 7, 12, 9, 12, 7, 8, 10, 9, 11, 10, 9, 8, 11 9, 10, 10, 12, 11, 11, 8, 11, 9, 11, 8, 11 a) Complete the table below	10

Score x	Tally	Frequency f	Cumulative Frequency	$f \times x$
7	II	2	2	14
8	IIII	4	6	32
9	卌	5	11	45
10	IIII	4	15	40
11	卌II	7	22	77
12	III	3	25	36
		25		244

b) Find the:

(i) Mean $9\frac{19}{25}$

(ii) Mode 11

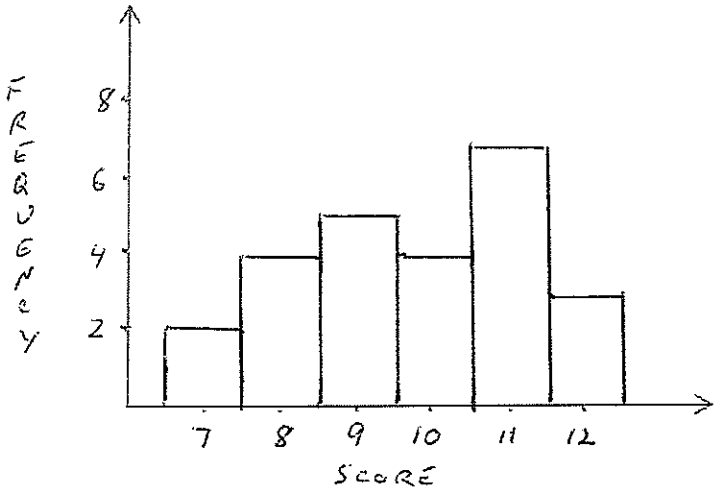
(iii) Median 10

(iv) Range 5

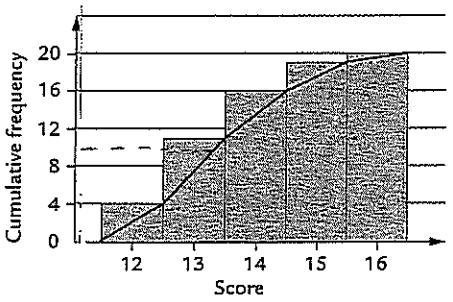
c) What percentage of scores are less than 10?

$\frac{11}{25} \times 100 = 44\%$

d) Construct a frequency histogram for the table on page 1



3. For the cumulative frequency histogram/polygon below



4

a) Find the median 13

b) Complete the table:

Score	Frequency
12	4
13	7
14	5
15	3
16	1

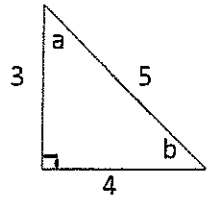
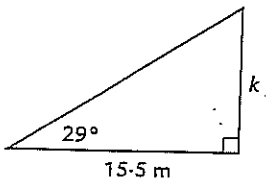
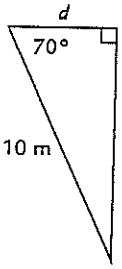
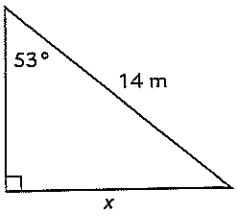
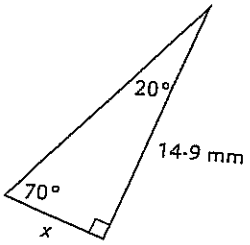
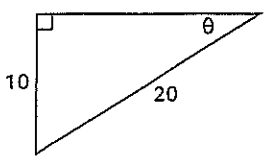
c) How many scores were there? 20

4. a) Complete the table

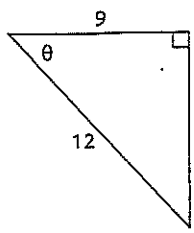
2

Class	Class Centre	Frequency
11-15	13	8
16-20	18	7
21-25	23	5

b) What is the modal class? 11-15

Trigonometry (20 Marks)	Marks
1.  sin a = $\frac{4}{5}$ tan a = $\frac{4}{3}$ cos b = $\frac{4}{5}$ tan b = $\frac{3}{4}$	4
2. Find the pronumeral to one decimal place: a)  $\frac{k}{15.5} = \tan 29°$ $k = 8.6\text{ m}$ b)  $\frac{d}{10} = \cos 70°$ $d = 3.4\text{m}$ c)  $\frac{x}{14} = \sin 53°$ $x = 11.2\text{ m}$ d)  $\frac{x}{14.9} = \tan 20°$ $x = 5.4\text{ mm}$	8
3. Find θ to the nearest degree: a)  $\sin\theta = \frac{10}{20}$ $\theta = 30°$	6

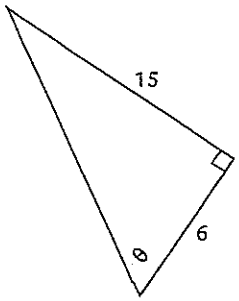
b)



$\cos\theta = \frac{9}{12}$

$\theta = 41^\circ$

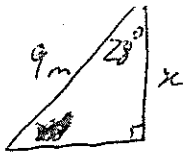
c)



$\tan\theta = \frac{15}{6}$

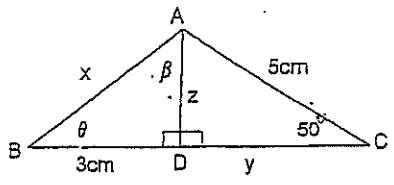
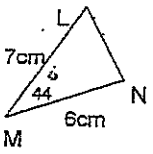
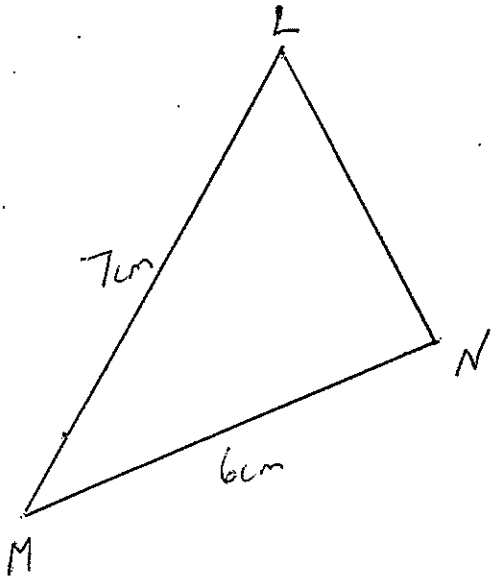
$\theta = 68^\circ$

5. A ladder 9m long leans against a wall. If it makes an angle of 28° with the wall, how far up the wall does it reach? Give your answer to the nearest m. 2

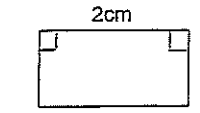


$\frac{x}{9} = \cos 28^\circ$

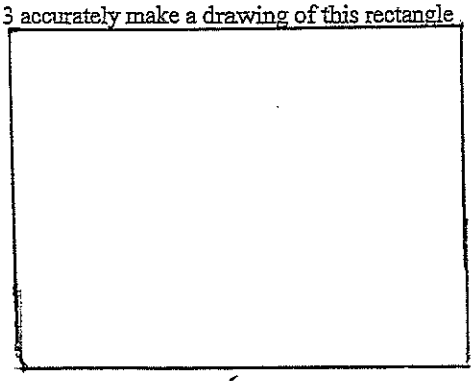
$x = 8\text{m}$

Congruence and Similarity (20 Marks)	Marks
1.  Given that $\Delta ABD \equiv \Delta ACD$ find:- $x =$ 5cm $y =$ 3cm $z =$ 4cm $\theta =$ 50° $\beta =$ 40°	5
2. Using a ruler, protractor and pencil accurately construct ΔLMN with side LM = 7 cm MN = 6 cm and $\angle LMN = 44^0$ in the space below. **Clearly label the triangle LMN.**  	2
3. Write **True** or **False**. Similar figures :- (a) are the same size. F (b) are the same shape T (c) have matching angles equal T (d) have matching sides equal F	4

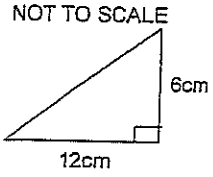
4. (a)Using an enlargement factor of 3 accurately make a drawing of this rectangle

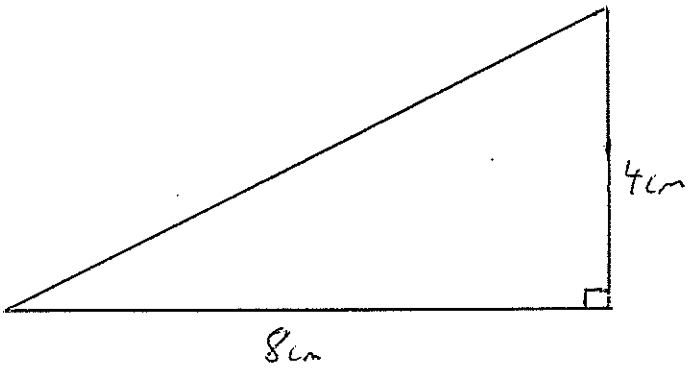


NOT TO SCALE



(b) Using a scale factor of $\frac{2}{3}$ make a copy of this triangle





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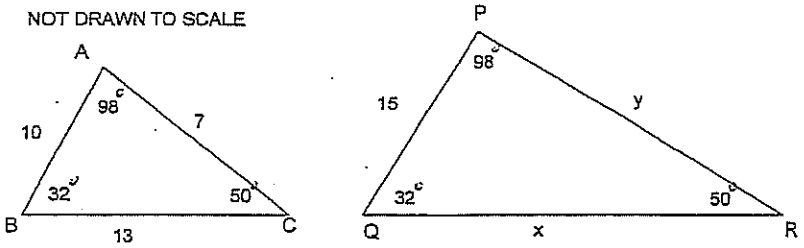
5.



These triangles are not drawn to scale.

(a) Explain why the triangles must be similar.

Matching angles the same

(b) Which side in ΔPQR matches side AB? PQ

(c) What is the scale factor used to form the similar triangles? 1.5

(d) Use the scale factor to calculate the length of :-

Side x = 19.5

Side y = 10.5

5