

Carlingford High School



Year 9 (5.3) Mathematics

Term 4 Exam 2018

Print your Name: _____

Circle your class:

9MA31 (Mrs Blakeley)

9MA32 (Mr Gong)

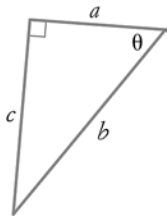
9MA33 (Ms Bennett)

- Time allowed: **50 minutes**
- Approved calculators may be used
- Show all necessary working
- Marks may be deducted for untidy setting out
- Marks for questions are indicated in brackets

TOPICS	Marks	
Right-angles trigonometry	/21	
Single variable data analysis	/19	
Indices	/27	
TOTAL	/67	%

TRIGONOMETRY

1. In the triangle below, $\cos \theta =$ [1]



- A $\frac{a}{b}$ B $\frac{c}{b}$
C $\frac{c}{a}$ D $\frac{b}{a}$

2. Evaluate $\frac{12}{\cos 35^\circ}$ [1]

- A 12.02 B 14.65
C -13.28 D 0.34

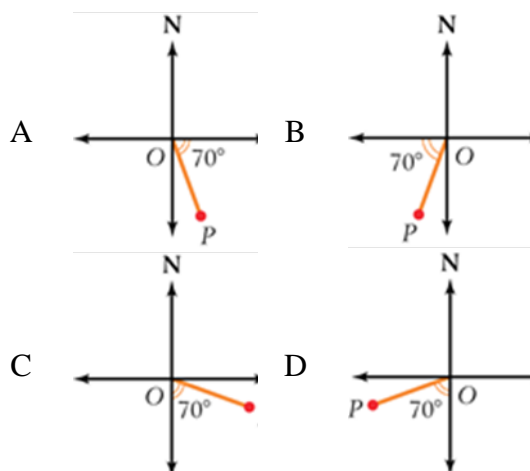
3. $45^\circ 3'$ is the same as: [1]

- A 45.05° B 45.3°
C 45.5° D 45.03°

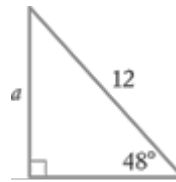
4. If $\cos \theta = 0.5$, what is the value of θ ? [1]

- A 60° B 30°
C 1° D 53°

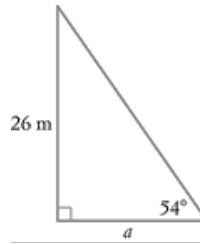
5. Which diagram shows P with a bearing of 200° from O ? [1]



6. Find the length of a , correct to 2 decimal places. [2]

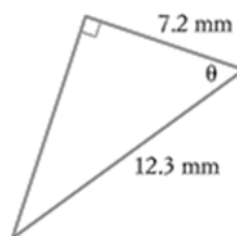


7. Find the length of a , correct to 2 significant figures. [2]

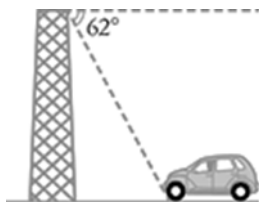


8. A right-angled triangle has the ratio $\tan \theta = \frac{5}{17}$. Find the exact ratio of $\sin \theta$. [3]

9. Find the value of θ , correct to the nearest minute. [2]



10. From the top of a 200 m tall tower, the angle of depression to a car is 62° . How far is the car from the foot of the tower? Answer to the nearest metre.



11. Two ships leave from the same port. One ship travels on a bearing of 157° at 20 knots. The second ship travels on a bearing of 247° at 35 knots. (1 knot is a speed of 1 nautical mile per hour).

(a) Draw a diagram to represent the information given in the question.

(b) How far apart, in nautical miles, are the ships after 8 hours? Correct to 2 decimal places.

- (c) Calculate the bearing of the second ship from the first, to the nearest minute.

DATA

1. Which of the following is an example of discrete quantitative data? [1]

A a person's gender
B the speed of a car
C shirt size
D the height of a person

2. The statistic that is not affected by an outlier is the: [1]

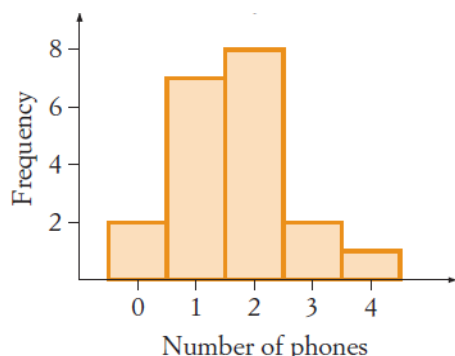
A mean B mode
C range D median

3. (a) Complete the frequency table below. [2]

Score, x	Frequency, f	fx
4	12	
5	8	
6	7	
7	4	
	$\Sigma f =$	$\Sigma fx =$

- (b) Calculate the mean, correct to 2 decimal places. [1]

4. Twenty households were surveyed about how many phones, including mobile phones, they owned. The results are shown in the frequency histogram below.



- (a) What is the mode? [1]
- (b) Find the mean correct to 2 decimal places. [1]
- (c) Find the median. [1]
- (d) Find the range [1]

5. (a) Complete the cumulative frequency table below. [2]

Score	Frequency	Cumulative Frequency
32	5	
33	8	
34	12	
35	9	
36	7	

- (b) Find the median. [1]

6. This back-to-back stem-and-leaf plot shows the results of a Year 9 class in a Probability exam.

Boys		Girls
4 2	3	
9 8 7 4 3 0	4	5 7 8
9 9 9 6 5 3 2 2	5	3 4 4 9 9
7 4 4 1 0	6	0 3 4 4 7 7 7 8
4 3 2	7	0 1 5 5 8 8
5 2	8	4 8 8
1	9	0 9

- (a) Find the median score for: [2]
- (i) boys
- (ii) girls
- (b) The mean for the girls is 68.0. Calculate the mean for the boys, correct to one decimal place. [1]
- (c) Who performed better on the test? Give reasons. [2]

7. Tamara scored a mean of 74% for 5 maths tests that she completed. Tamara did a sixth test and her mean test mark increased to 77%. What mark did she achieve in the last test? [2]

INDICES

1. Simplify each expression:

(a) $9u^3v \times 6uv^2w^8 =$

[1]

(b) $24m^8 \div 8m =$

[1]

(c) $\frac{12x^5y^4}{16x^3y^5} =$

[1]

(d) $(-2hj^5)^3 =$

[1]

(e) $\left(\frac{7k^2}{10}\right)^2 =$

[1]

(f) $-6r^0 =$

[1]

(g) $\left(\frac{8}{5}\right)^{-2} =$

[1]

(h) $(8w)^{\frac{2}{3}} =$

[1]

2. Simplify each expression, using a positive index.

(a) $2b^{-5} =$

[1]

(b) $(c^2d)^{-3} =$

[2]

3. Write $v^{\frac{2}{3}}$ using a radical (root) index.

[1]

4. Write each expression using a fractional index.

(a) $\sqrt[7]{x} =$

[1]

(b) $\sqrt[4]{(7n)^3} =$

[1]

5. Simplify each expression:

(a) $(18q^5r^8 \div 3q^2r^{-1})^2$

[2]

(b) $\left(\frac{64}{y^3}\right)^{-\frac{2}{3}}$

[2]

(c) $(27x^2)^{\frac{1}{3}} \div \frac{1}{3}(x^3)^{\frac{1}{2}}$

[3]

(without a negative index)

6. Express 31 000 in scientific notation.

[1]

7. Express 6×10^{-5} in decimal form:

[1]

8. Write each number correct to four significant figures.

(a) 23 687 149 =

[1]

(b) 0.000 827 036 =

[1]

9. The distance light travels in one year is called a light year. If the speed of light is approximately 3×10^5 km/s, how far does light travel in a leap year? Answer in scientific notation, correct to three significant figures.

[2]

END OF EXAM

