Carlingford High School

Mathematics

Year 9, 5.1 Term 3 Test 2019

Name: SOLUTIONS

Ms Bennett

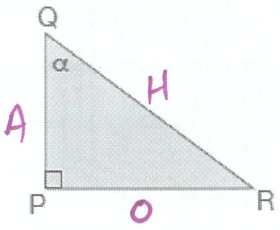
Time allowed: The whole period

- Show all necessary working.
- Answer all questions in the spaces provided.
- Marks may be deducted for careless or untidy work.
- Complete the examination in blue or black pen.
- Calculators may be used
- Study notes may be used

Topic	Trigonometry	Investigating Data	Total
Mark	/33	/37	/70

Part 1: Trigonometry

1. In the following triangle, label the Opposite, Adjacent and Hypotenuse with O, A, and H. **[3]**

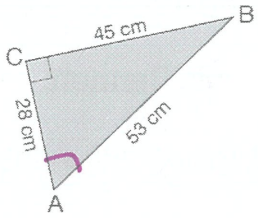


2. Fill in the blanks: **[4]**

SOHCAHTOA means:

$$sin\theta = \frac{opp}{hyp} \quad cos\theta = \frac{Adj.}{hyp} \quad tan\theta = \frac{opp}{adj.}$$

3. For the following triangle, write down the value of the following ratios: **[3]**

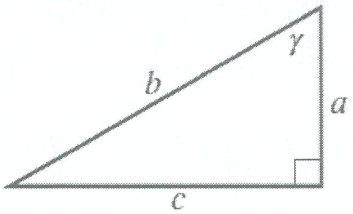


a) $tanA =$ $\frac{45}{28}$

b) $sinA =$ $\frac{45}{53}$

c) $cosA =$ $\frac{28}{53}$

4. Circle the **correct** trigonometric ratio for the triangle below: **[1]**



A $\tan(\gamma) = \frac{a}{c}$

B $\sin(\gamma) = \frac{c}{a}$

C $\cos(\gamma) = \frac{c}{b}$

D $\sin(\gamma) = \frac{c}{b}$

5. Using your calculator, find the following unknown values, rounding to 1d.p.

a) $\sin(52^0)=$ 0.8

b) $7.2\cos(19^0)=$ 6.8

c)) $200\tan(37.5^0)=$ 153.5

[3]

6. Using your calculator, find the following unknown angles, rounding to the nearest degree.

[3]

a) $tan\theta = 2.3$

$\theta =$ 67°

b) $cos\theta = \frac{2}{3}$

$\theta =$ 48°

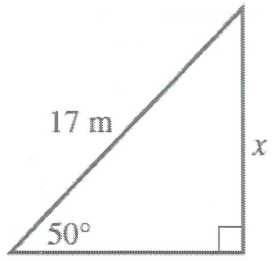
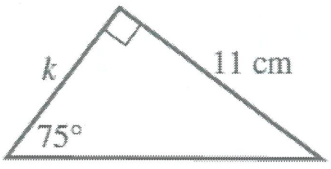
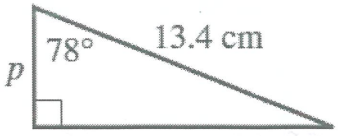
c) $sin\theta = \frac{7}{11}$

$\theta =$ 40°

Write down all steps of working out for the following questions:

7. For the following triangles, calculate the missing sides, to 1d.p.

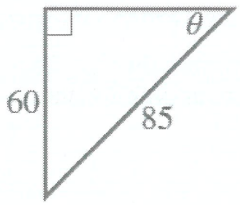
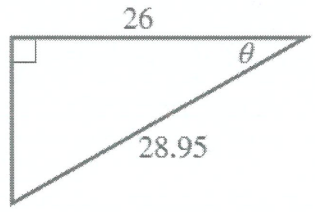
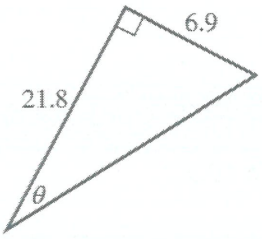
SOHCAHTOA

Question	Working and answer
a) 	$\sin 50 = \frac{x}{17}$ $x = 17 \times \sin 50$ $= 13.0\ m$
b) 	$\tan 75 = \frac{11}{k}$ $k = \frac{11}{\tan 75}$ $= 2.9\ cm$
c) 	$\cos 78 = \frac{p}{13.4}$ $p = 13.4 \times \cos 78$ $= 2.8cm$

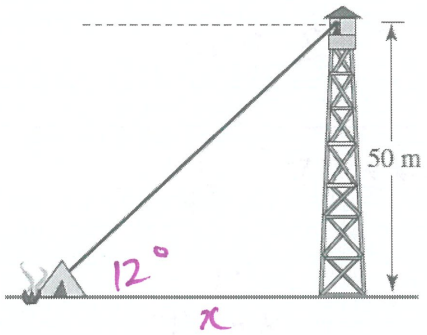
[2] [2] [2]

8. For the following triangles, calculate the missing angles, to the nearest degree:

SOHCAHTOA

Question	Working and answer	
a) 	$\sin\theta = \frac{60}{85}$ $\theta = \sin^{-1}\left(\frac{60}{85}\right)$ $= 45^\circ$	[2]
b) 	$\cos\theta = \frac{26}{28.95}$ $\theta = \cos^{-1}\left(\frac{26}{28.95}\right)$ $= 26^\circ$	[2]
c) 	$\tan\theta = \frac{6.9}{21.8}$ $\theta = \tan^{-1}\left(\frac{6.9}{21.8}\right)$ $= 18^\circ$	[2]

9. Read the following information carefully:
A campsite is located some distance away from a lookout, which is 50m above the ground. From the campsite, the angle of elevation to the top of the lookout is 12^0. Find the distance (x) from the camp to the base of the lookout.



a) Place the 12^0 and the x in the correct location on the diagram. [2]

12^0 x

b) Calculate the value of x. (The distance from the camp to the base of the lookout). [2]

$\tan 12 = \frac{50}{x}$

$x = \frac{50}{\tan 12} = 235\text{ m}$ (Nearest m)

Part 2: Investigating data

1. Classify each of the following data as either:
Categorical **Numerical Discrete** **Numerical Continuous**

	Classification (circle the correct one)
Eye colour	Categorical/ Numerical Discrete/ Numerical Continuous
How many books are in each school bags	Categorical/ Numerical Discrete/ Numerical Continuous
How long it takes you to travel to school	Categorical/ Numerical Discrete/ Numerical Continuous
Attendance at the zoo each day	Categorical/ Numerical Discrete/ Numerical Continuous
Incomes of parents	Categorical/ Numerical Discrete/ Numerical Continuous
Type of transport used to go to work each day	Categorical/ Numerical Discrete/ Numerical Continuous

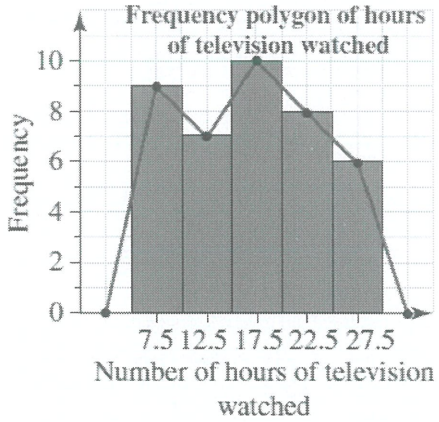
[6]

2. For the following data collection activities, identify whether the data should be collected via **a census or a sample.**

Data collection activity	**How should it be collected: (Circle)**
Voting preferences in Australia	Census/ Sample
Favourite sporting activity in your class	Census/ Sample
Favourite car colour sold in NSW	Census/ Sample

[3]

3. Answer the questions about the following **Frequency Histogram and Polygon** where students were surveyed on how many hours of television they watch each week.



a) How many people watched 12.5 hours of television?

7

[3]

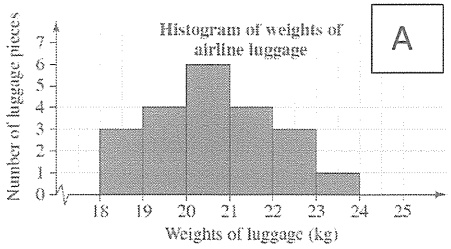
b) What was the modal number of hours of television watched?

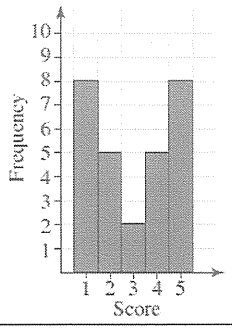
17.5

c) How many people watched 22.5 hours of television or more?

8+6=14

4. Match the following diagrams up with the correct description-

<table>
<tr>
<td>
A


</td>
<td>
B


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</tr>
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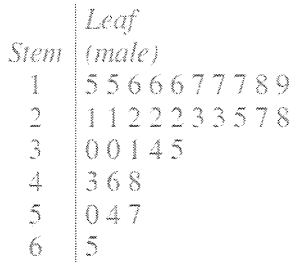
<td>
C


Stem	Leaf (male)
1	5 5 6 6 6 7 7 7 8 9
2	1 1 2 2 2 2 3 3 5 7 8
3	0 0 1 4 5
4	3 6 8
5	0 4 7
6	5

</td>
<td>
D
Key: 14 | 6 = 1.46

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

</td>
</tr>
<tr>
<td>Positive Skew A/ B/ C/ D</td>
<td>Negative Skew A/ B/ C/ D</td>
</tr>
<tr>
<td>Symmetrical A/ B/ C/ D</td>
<td>Bimodal A/ B/ C/ D</td>
</tr>
<tr>
<td colspan="2">Circle the correct graph</td>
</tr>
</table>

[4]

TEST CONTINUES ON NEXT PAGE

5. The following data shows how many extra-curricular activities students engage in, in one class.

0, 1, 4, 3, 2, 7, 2, 1, 2, 2, 1, 0, 3, 2, 2, 3, 4, 1, 1, 2, 1, 4, 2, 0, 2

a) Complete the frequency table for this data:

Number of activities (x)	Tally	Frequency	Frequency x score
0	III	3	0
1	𝍸 I	6	6
2	𝍸 IIII	9	18
3	III	3	9
4	III	3	12
5		0	0
6		0	0
7	I	1	7
Total		= 25	= 52

[4]

From this frequency table calculate:

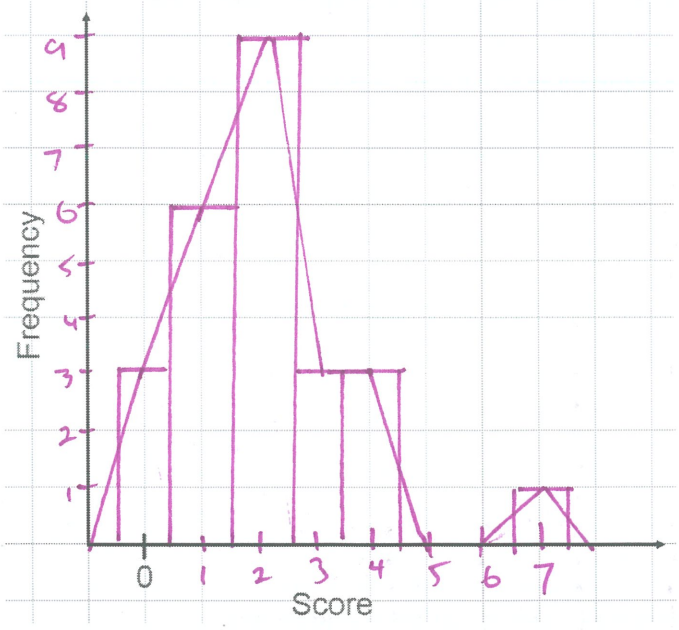
b) The mode 2

c) The mean $\frac{52}{25} = 2.7$ (2.08)

d) The range 7 - 0 = 7

[3]

e) Turn this frequency table into a frequency histogram **and** polygon. You will need to complete the values on the vertical and horizontal axis.



[4]

f) Describe the shape of the data. (Is it positive skew, negative skew, symmetrical or bimodal?) positive skew

[2]

g) Are there any outliers? If so, what is it?

7.

6. The following shows a stem-and-leaf diagram:

CD collection size of 20 students

Key: 2 | 5 = 25 CDs

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

a) What number does the circled value represent? 49 [4]

b) What is the range? 56 − 4 = 52

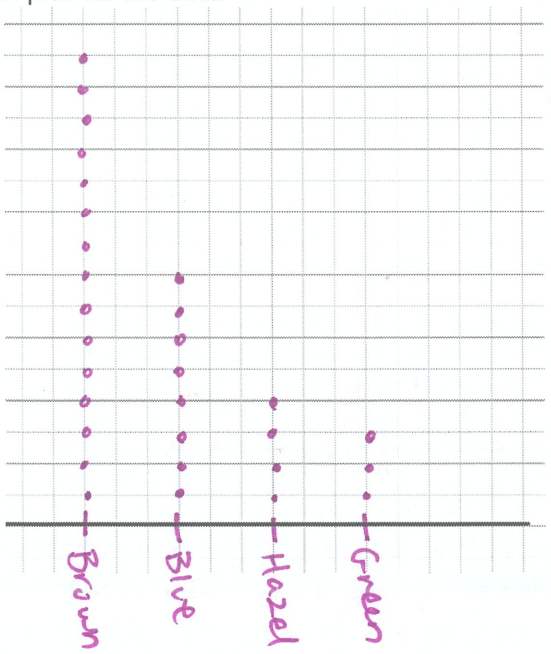
c) What is the median? 35

d) Are there any clusters? If so, what are they? 30s

7. A sample of students surveyed for the Australian Bureau of Statistics were asked: 'What is the colour of your eyes?' The results were as followed:

Brown	Hazel	Blue	Brown	Brown	Green	Green	Brown	Brown	Hazel
Brown	Brown	Brown	Brown	Blue	Brown	Green	Blue	Blue	Blue
Brown	Brown	Brown	Brown	Hazel	Blue	Hazel	Blue	Brown	Blue

a) Construct a dot plot for the data [4]



b) Circle the correct answer:

This data is: Categorical/ Numerical Discrete/ Numerical Continuous