Carlingford High School

Year 9 Mathematics 5.3

2019 Term 4 Examination

Name: _____

Circle your teacher's name: Mrs Wilson/Young Miss Aung Mrs Lego Mr Wilson

Time allowed: 50 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.

Topic	Equations	Indices	Geometry	Total
Mark	**/19**	**/24**	**/25**	**/68**

Equations (19 marks)

1. Solve for *x*

a) $3x + 7 = 5$ 1

b) $3y - 5 = -14 - 2y$ 2

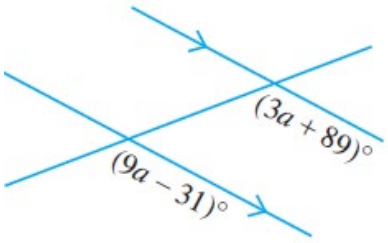
c) $3(x + 2) - 7 = 11$ 2

d) $2(x - 1) = 1 - (3 - x)$ 2

2. a) Write an equation and find the number. 2

Seven more than a number is three more than twice the number.

b) Form an equation and solve to find the value of the pronumeral. 2



3. Solve the following

a) $\frac{x-2}{5} + 8 = 11$ 2

b) $\frac{5x+2}{6} = \frac{7x-4}{5}$ 3

c) $\frac{x-7}{4} - \frac{x-1}{9} = 1$ 3

Indices (24 marks)

4. Simplify fully

a) $a^6 \times a^9$ 1

b) $2x^3 \times 4x^2$ 1

c) $\frac{y^{11}}{y^5}$ 1

d) $20a^3b^2 \div 10ab$ 2

e) $(2x^3)^2$ 2

f) $6x^0$ 1

g) $(4a^3)^0 - 6a^0$ 2

h) Simplify each expression, using a positive index. 3

i) $\left(\frac{4}{5}\right)^{-1}$ *ii)* $\left(\frac{3}{2x}\right)^{-2}$

i) Write using a negative index

$\frac{4}{y^3}$ 1

j) Write using a radical (root) sign

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

k) Write using a fractional index

$\sqrt[4]{123}$ 1

l) Simplify fully

$\left(\frac{125}{x^3}\right)^{\frac{-2}{3}}$ 2

m) Express 293.2 in scientific notation 1

n) Express 4.2×10^{-4} in decimal form 1

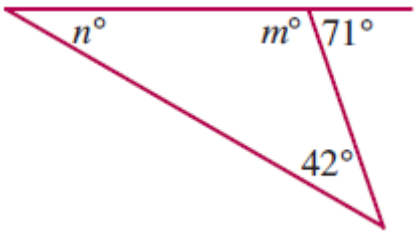
o) If the average distance from the Earth to the Sun is $1.4951 \times 10^8 km$ and light travels at $3 \times 10^5 km/s$, how long does it take for light to travel from the Sun to the Earth in minutes? (answer to 3 decimal places) 2

p) Evaluate the expression in scientific notation, correct to three significant figures. 2

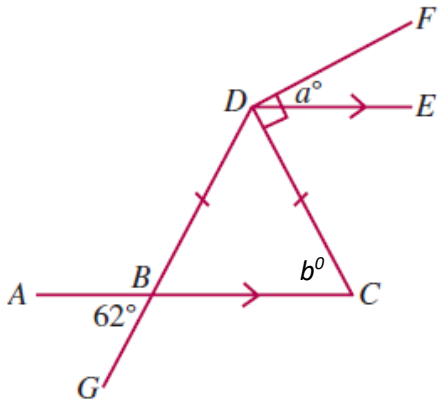
$\sqrt[4]{(5.2999 \times 10^{-2})^{10}}$

5. **Geometry (marks 25)**

a) Find the value of all pronumerals, ***giving reasons.*** 2



b) Find the value of a and b (***without reasons***) 2



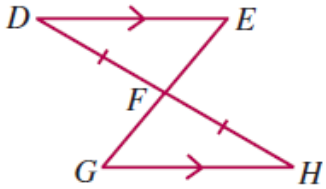
c) The sum of the interior angles of a regular polygon is 1980^0. 2

i) How many sides has the polygon?

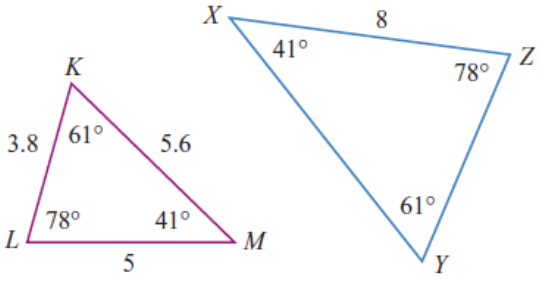
2

ii) Find the size of each exterior angle, to the nearest minute.

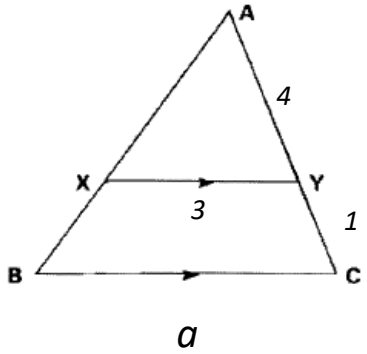
d) Prove that $\Delta DEF \equiv \Delta HGF$. 3



e) Find the enlargement factor for the similar triangles 1



f) i) $XY \parallel BC$, Prove that triangles AXY and ABC are similar. 2

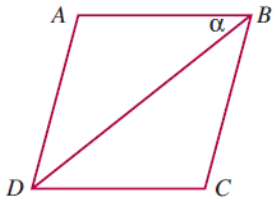


a

2

ii) Find the value of a.

g)

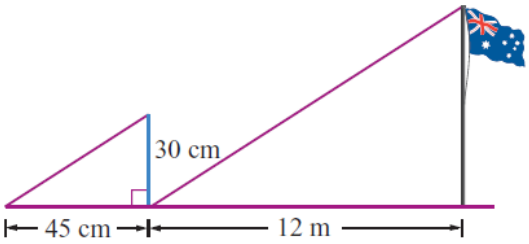


ABCD is a parallelogram. The diagonal BD bisects ∠ADC. Let ∠ABD = α.

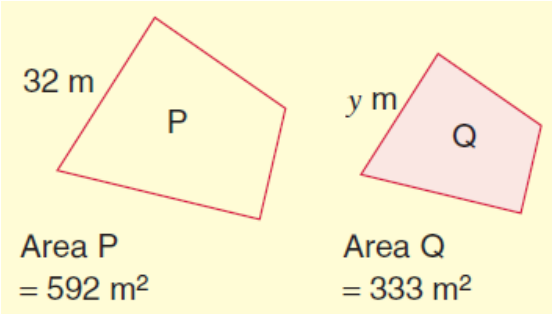
i) Prove that AB = AD. 3

ii) Explain what special quadrilateral is ABCD. 1

h) On a bright sunny day the shadow cast by a flagpole is 12 m long. At the same time the shadow cast by a 30 cm ruler is 45 cm long. Find the height of the flagpole. 3



i) Find the value of y if the two figures are similar. 2



End of exam