Carlingford High School

Mathematics

Year 9, 5.1 Term 2 Examination 2019

Name: Answers.

Ms Bennett

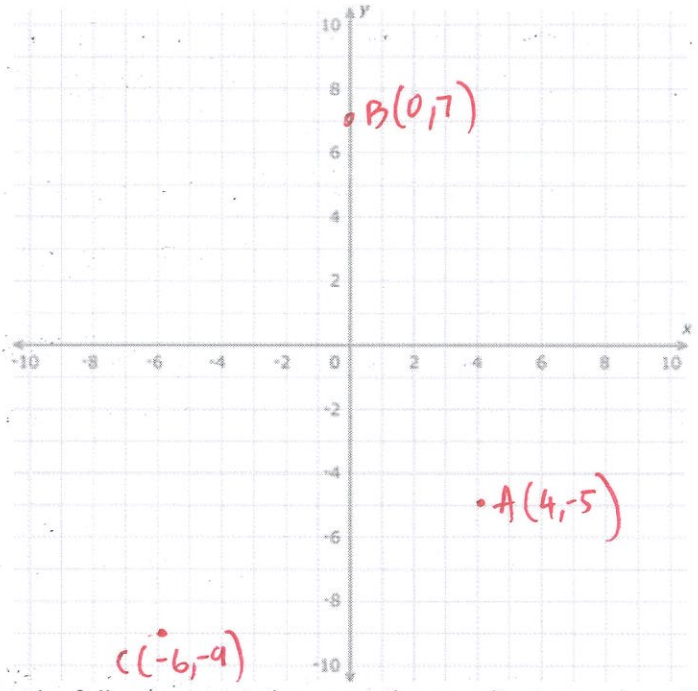
Time allowed: The whole period

- 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

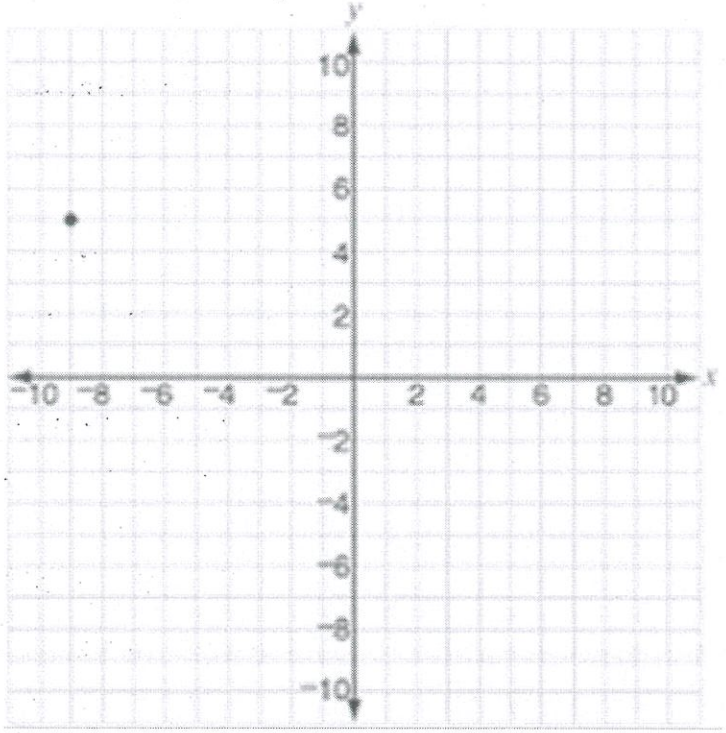
Topic	Linear Relationships	Area, Surface Area and Volume	Algebraic Expressions	Total
Mark	/18	/29	/28	/75

Section 1: Linear relationships (18 marks)

1. On the following coordinate graph, plot and label the points A $(4, -5)$, B $(0, 7)$ and C $(-6, -9)$ **3**



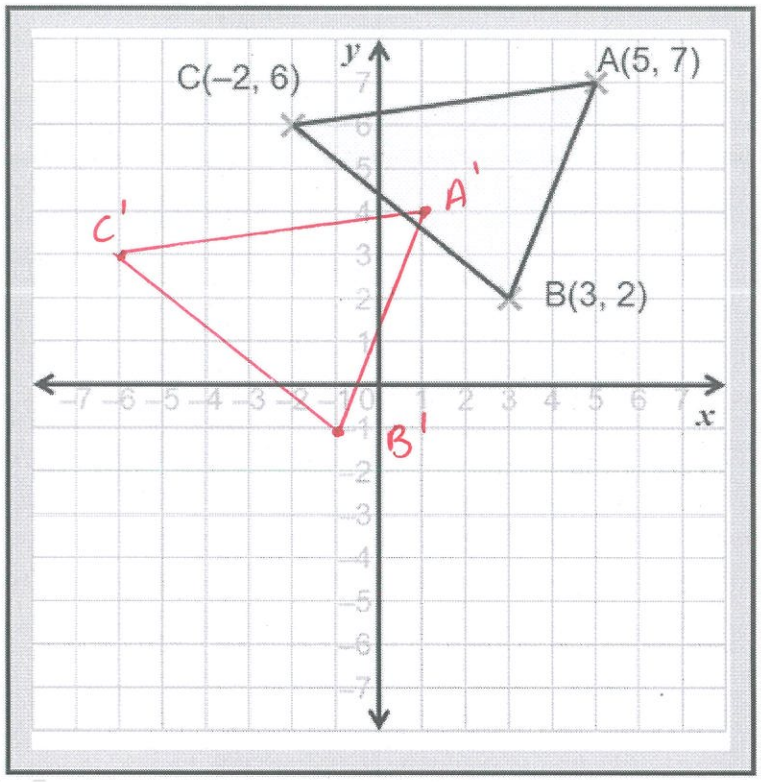
2. For the following point shown on the coordinate graph, write down the coordinate and which quadrant it is in: **2**



Coordinate: (-9, 5)

Quadrant: 2

3. Translate this triangle 4 units to the left and 3 units down. Mark the vertices of the new triangle A′, B′ and C′ **3**



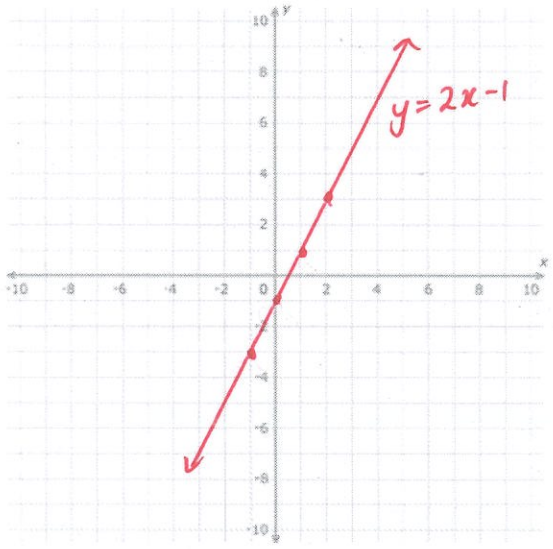
4. For the following equations, complete the table of values, then graph the line on the coordinate graph given.

a)

$$y = 2x - 1$$

x	-1	0	1	2
y	−3	−1	1	3

3

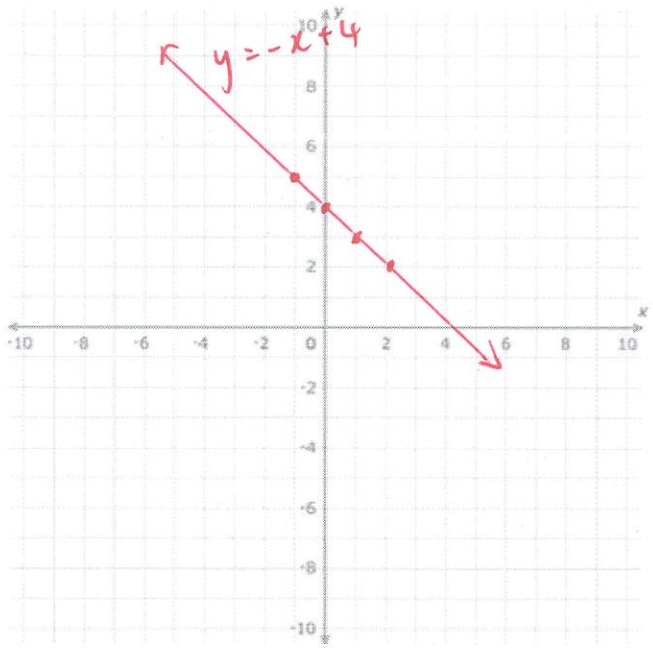


3

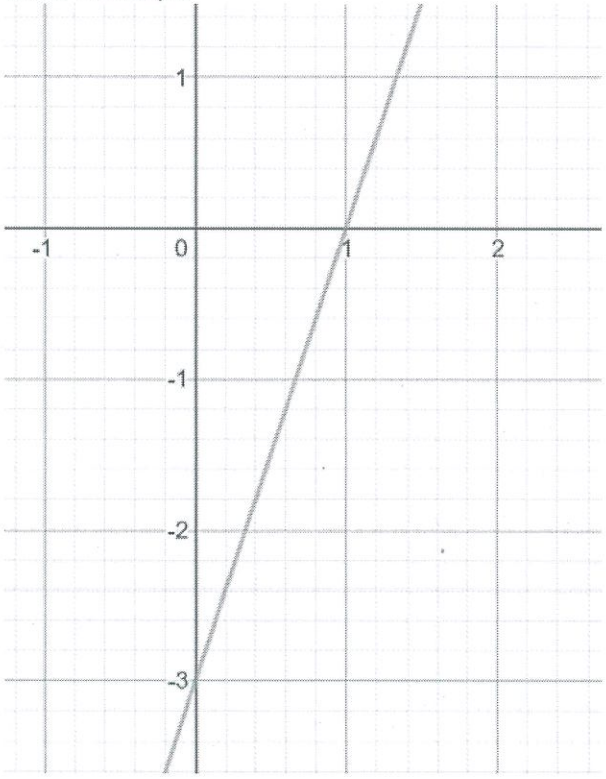
b)

$$y = -x + 4$$

x	-1	0	1	2
y	5	4	3	2



5. This graph shows the equation $y = 3x - 3$. Write down the y-intercept and the x-intercept. **2**



y-intercept = -3

x-intercept = 1

6. Does the point $(5, 2)$ lie on the line $y = 2x - 8$? Show working out to justify your answer. **2**

sub in (5, 2)

$2 = 2 \times 5 - 8$

$2 = 10 - 8$

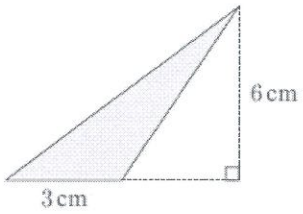
$2 = 2$ ✓ yes

∴ it does lie on the line

Part 2: Area, Surface Area and Volumes- 29 marks

7. Find the area for the following shapes. If necessary give the answer to 1d.p. **8**

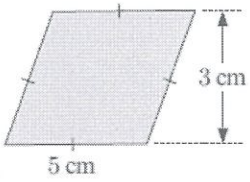
a)



$A = \frac{1}{2} \times 3 \times 6$

$= 9 \text{ cm}^2$

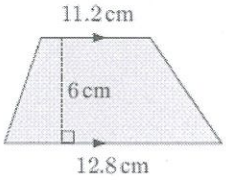
b)



$A = 5 \times 3$

$= 15 \text{ cm}^2$

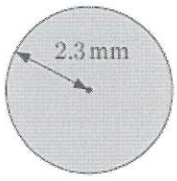
c)



$A = \frac{1}{2}(11.2 + 12.8) \times 6$

$= 72 \text{ cm}^2$

d)

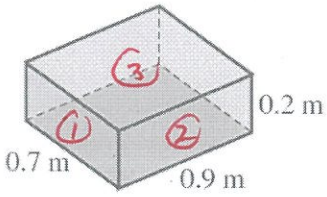


$A = \pi \times 2.3^2$

$= 16.6 \text{ mm}^2$ (1dp)

8. Find the surface area of the following prisms, correct to 2d.p. **3**

a)



① sides

$0.7 \times 0.2 \times 2 = 0.28$

② Front + back

$0.9 \times 0.2 \times 2 = 0.36$

③ Top + bottom

$0.7 \times 0.9 \times 2$

$= 1.26$

Total

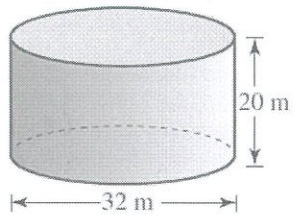
$0.28 + 0.36 + 1.26$

$= 1.9 \text{ m}^2$

$A = 2\times\pi\times 16^2 + 2\times\pi\times 16\times 20$

$= 3619.1\ m^2$ (1dp)

b) 3



Surface Area of a cylinder:

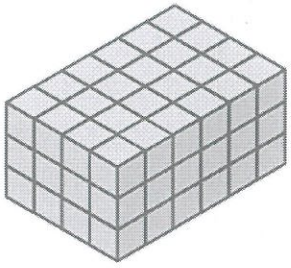
$A = 2\pi r^2 + 2\pi rh$

R=radius, h=height

$r = 16 \quad h = 20$

9. Calculate the volume of the following objects:

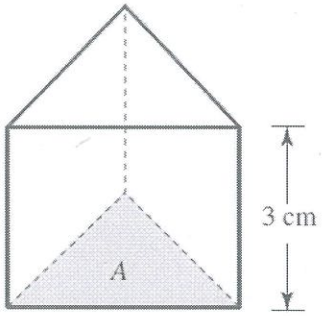
a) 2



12×6

$= 72\ u^3$

b) 2



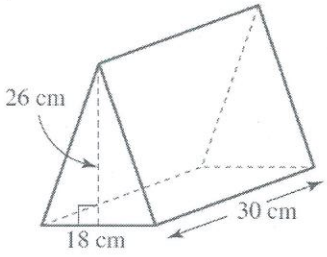
$A = 4\ cm^2$

Ans

$V = 4\times 3$

$= 12\ cm^3$

c) 3

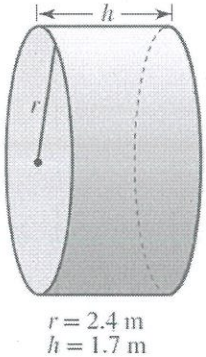


$V = \left(\frac{1}{2}\times 18\times 26\right)\times 30$

↑ triangle

$= 7020\ cm^3$

d) (correct to 2d.p.) 3



$r = 2.4$ m

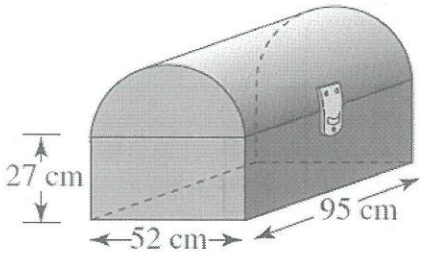
$h = 1.7$ m

$V = \pi r^2 h$

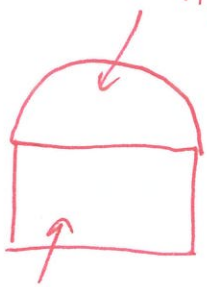
$= \pi\times 2.4^2\times 1.7$

$= 30.76\ m^3$ (2dp)

10. a) Find the volume of this wooden chest: 3



$A_2 = \frac{1}{2} \times \pi \times 26^2$
$= 1061.86 \text{ cm}^2$



Total
$A = 1061.86 + 1404$
$= 2465.86$

$A_1 = 52 \times 27$
$= 1404 \text{ cm}^2$

$\therefore V = 2465.86 \times 95$
$= 234256.54 \text{ cm}^3$

b) Find the capacity of the wooden chest in Litres, to 1d.p. 2

$234256.54 \div 1000 = 234.3 \text{ L (1dp)}$
m1

Part 3- Algebraic Expressions- 28 marks

11. Write the following worded statements as an algebraic expression:

a) The sum of a and 5

$a + 5$ 1

b) The product of x and y

xy 1

c) The quotient of m and 8

$\frac{m}{8}$ 1

d) 5 multiplied by the sum of a and b

$5(a+b)$ 1

12. Circle whether the following statements are true or false:

a) $ab = ba$ 1

(True) False

b) $\frac{m}{n} = \frac{n}{m}$ 1

True (False)

13. Calculate the following substitutions given that:

$a = 5$ $b = 2$ $c = -3$ 1

a) $2a$ $2 \times 5 = 10$ 1

b) $a - b$ $5 - 2 = 3$ 1

c) $a + b + c$ $5 + 2 - 3 = 4$ 1

d) $3bc$ $3 \times 2 \times -3 = -18$ 1

e) c^2 $(-3)^2 = 9$ 1

14. Simplify the following expressions:

a) $5a + 3a + 2$ $= 8a + 2$ **1**

b) $6t + 4 - 2t - 1$ $= 4t + 3$ **1**

c) $7x^2 + x - x^2 + 6x$ $= 6x^2 + 7x$ **1**

d) $5m \times 2n$ $= 10mn$ **1**

e) $-2a \times -3ab$ $= 6a^2b$ **1**

f) $16hk \div 8k$ $= 2h$ **1**

15. Expand the following brackets:

a) $4(y + 5)$ $4y + 20$ **1**

b) $-2(2g - 3)$ $-4g + 6$ **1**

16. Expand and simplify:

a) $10 + 3(a - 2)$ $= 10 + 3a - 6$ $= 4 + 3a$ **2**

b) $4(m + 2) + 2(m - 5)$ $= 4m + 8 + 2m - 10$ $= 6m - 2$ **2**

c) $7a(a + 1) - 3a(a - 2)$ $= 7a^2 + 7a - 3a^2 + 6a$ $= 4a^2 + 13a$ **2**

17. Factorise:

a) $10m + 8$ $2(5m + 4)$ **1**

b) $18ab - 6a$ $6a(3b - 1)$ **2**