Carlingford High School

Year 9 (5.3) Mathematics

Term 1 Exam
2018

Name: _____ Class: 9MA3 _____

9MA31 (Ms Hooper, Ms Gamble) 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

TOPICS	Mark	Extension Mark (*)	TOTAL	
Financial Mathematics	/17	/3	/20	
Linear Relationships	/28	/2	/30	
TOTAL	/45	/5	/50	%

Financial Mathematics

1. UberEATS charges customers for delivering food using this system: A pick up fee of $5.50, a drop off fee of $3.50 and $2.20 per km for the delivery distance.

(a) A customer orders from a café that is 4km away from his house. How much does he have to pay for the delivery?

[2]

(b) UberEATS takes a 35% cut of the delivery fee. How much do they take on this order?

[1]

2. Jeremy works at JBHi Fi and gets paid $21.50 per hour, normal time. He receives 110% of his wage on a Saturday and double time on a Sunday.

(a) (*) How much will he earn in a week where he works 9 am to 4:30pm on Monday, Tuesday and Wednesday and 10am – 4pm on Saturday and Sunday?

[3]

(b) (Continued) If the hours that he works in part (a) are his usual hours each week, what will be his monthly wage?

[1]

(c) Jeremy is employed on a full-time basis, so he is entitled to 4 weeks holidays per year, with 17.5% of 4 weeks pay as a holiday loading.
What is the total amound he will receive as holiday pay?

[2]

3. Origin Bank is offering interest rate of 6.6% p.a. on lump sum deposits into a Long Term Account.
If the interest is compounded monthly, what will an amount of $15 000 be worth in 5 years time?

[2]

4. In the 2017-2018 financial year, Yuki is employed as an accountant with a salary of $78 000 per year. She also earns interest that year of $1580 from a term deposit. She has allowable deductions of $120 union fees, $150 association fees, $320 work related education expenses and $420 donation to charity.

(a) What is her gross income?

[1]

(b) What is her taxable income?

[1]

(c) The 2017-2018 tax table is below. The Medicare Levy is currently 2%. Calculate the total tax, including Medicare Levy, that Yuki will have to pay in the 2017-2018 financial year.

Taxable income	Tax on this income
0 – $18,200	Nil
$18,201 – $37,000	19c for each $1 over $18,200
$37,001 – $87,000	$3,572 plus 32.5c for each $1 over $37,000
$87,001 – $180,000	$19,822 plus 37c for each $1 over $87,000
$180,001 and over	$54,232 plus 45c for each $1 over $180,000

[3]

(d) (Continued) What will her net fortnightly income be?

[2]

5. Explain the difference between Simple Interest and Compound Interest

[2]

Linear Relationships

1. For the following equation, complete the table of values:

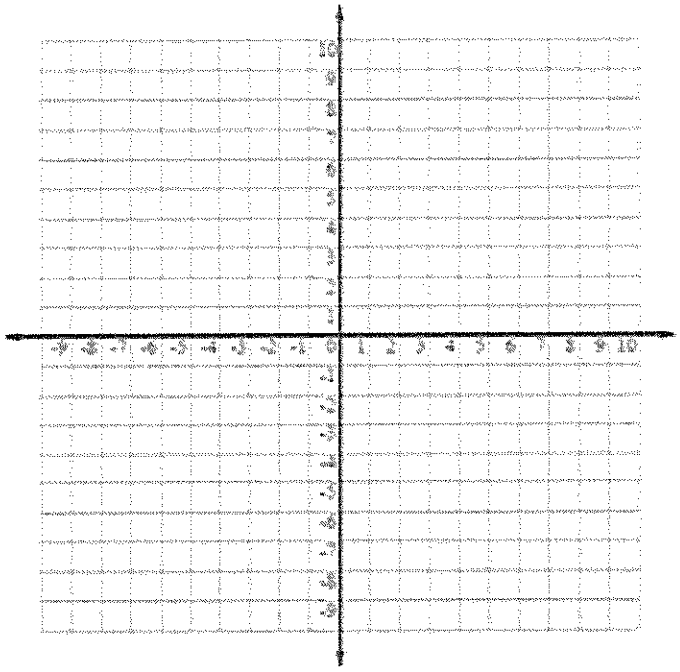
(a) $y = -2x + 5$

[2]

x	-1	0	1	2
y				

(b) Graph the equation on the coordinate axis below.

[2]



2. For the equation $y = \frac{1}{2}x + 2$,

(a) Find the y intercept

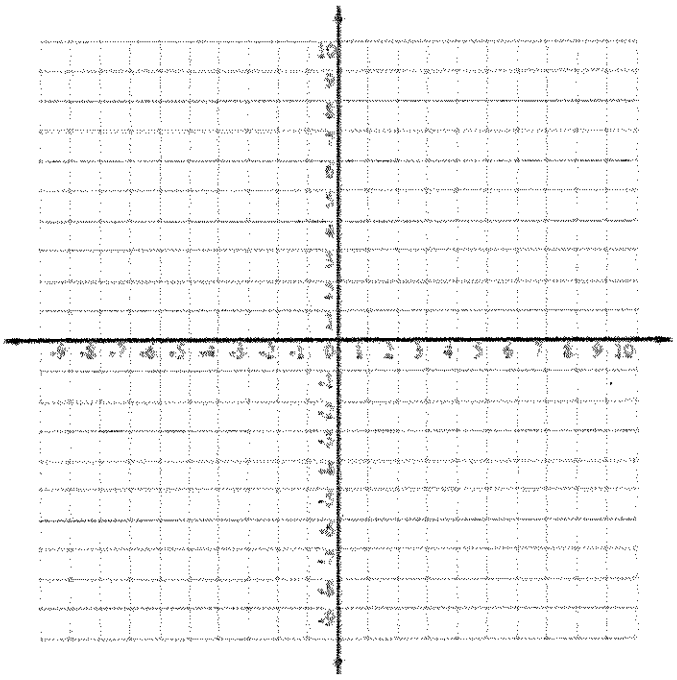
[1]

(b) Find the x intercept

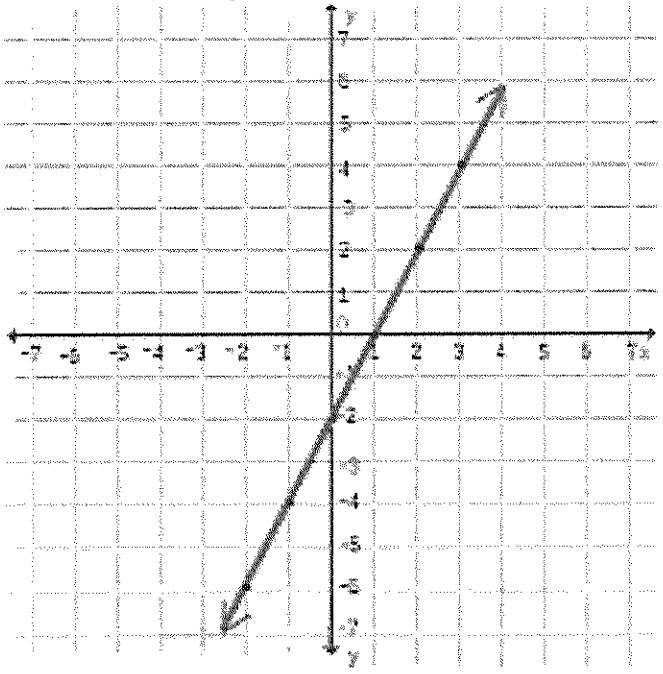
[2]

(c) (Continued) Use these results to graph the straight line.

[2]



3. For the following straight line:



(a) Write down the gradient:

[1]

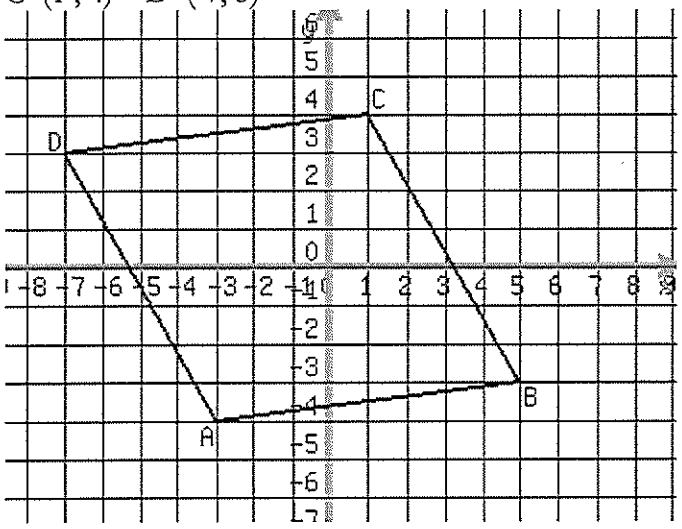
(b) Write down the y-intercept

[1]

(c) Write down the equation of the line

[1]

4. The following shape ABCD has A (-3, -4) B (5, -3) C (1 , 4) D (-7, 3)



(a) Use the midpoint formula to show that the diagonals bisect each other.

[3]

(b) Show that AD =DC

[3]

(c) **(*)** What shape is ABCD? Explain how you know.

[2]

5. (a) Does the point $(3, -2)$ lie on the line $2x + y - 7 = 0$?

[2]

(b) What is the gradient of the line $2x + y - 7 = 0$?

[2]

(c) What is the equation of the line parallel to $2x + y - 7 = 0$ which passes through the point $(3, 4)$?

[3]

6. Show that the points $(-6, -2)$, $(0, 2)$ and $(3, 4)$ are collinear.

[3]

END OF TEST
(Now check your work!)

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Term 1 Exam
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Financial Mathematics

1. UberEATS charges customers for delivering food using this system: A pick up fee of $5.50, a drop off fee of $3.50 and $2.20 per km for the delivery distance.

(a) A customer orders from a café that is 4km away from his house. How much does he have to pay for the delivery? [2]

5·50 + 3·50 +

2·20 × 4

= $17·80

(b) UberEATS takes a 35% cut of the delivery fee. How much do they take on this order? [1]

17·80 × 0·35

$6·23

2. Jeremy works at JBHi Fi and gets paid $21.50 per hour, normal time. He receives 110% of his wage on a Saturday and double time on a Sunday.

(a) (*) How much will he earn in a week where he works 9 am to 4:30pm on Monday, Tuesday and Wednesday and 10am – 4pm on Saturday and Sunday? [3]

7.5 hours Mon-Wed

6 hours Sat

8 hours Sun

7.5 × 21.50 × 3 +

6 × 21.50 × 1.1 +

6 × 21.50 × 2

= $883.65

(b) (Continued) If the hours that he works in part (a) are his usual hours each week, what will be his monthly wage? [1]

883·65 × 52 ÷ 12

= $3829.15

(c) Jeremy is employed on a full-time basis, so he is entitled to 4 weeks holidays per year, with 17.5% of 4 weeks pay as a holiday loading.
What is the total amound he will receive as holiday pay? [2]

883·65 × 4 +

883·65 × 4 × 0·175

= $4153.46

3. Origin Bank is offering interest rate of 6.6% p.a. on lump sum deposits into a Long Term Account.
If the interest is compounded monthly, what will an amount of $15 000 be worth in 5 years time? [2]

$$A = 15000\left(1 + \frac{0.066}{12}\right)^{60}$$

= $20845.67

(1) n and/or r correct.

(1) Correct answer.

4. In the 2017-2018 financial year, Yuki is employed as an accountant with a salary of $78 000 per year. She also earns interest that year of $1580 from a term deposit. She has allowable deductions of $120 union fees, $150 association fees, $320 work related education expenses and $420 donation to charity.

(a) What is her gross income?

[1]

78000 + 1580 (1)
= $79580

(b) What is her taxable income?

[1]

79580 − (120 + 150 + 320 + 420)

= $78570 (1)

(c) The 2017-2018 tax table is below. The Medicare Levy is currently 2%. Calculate the total tax, including Medicare Levy, that Yuki will have to pay in the 2017-2018 financial year.

Taxable income	Tax on this income
0 – $18,200	Nil
$18,201 – $37,000	19c for each $1 over $18,200
$37,001 – $87,000	$3,572 plus 32.5c for each $1 over $37,000
$87,001 – $180,000	$19,822 plus 37c for each $1 over $87,000
$180,001 and over	$54,232 plus 45c for each $1 over $180,000

[3]

(78570 − 37000) × 0.325 + 3572 (1)
= $17082.25 (1)

Medicare levy:

78570 × 0.02
= $1571.40 (2) (1)

Total tax = (1) + (2)
= $18653.65 (1)

(d) (Continued) What will her net fortnightly income be?

[2]

Net Income =
78570 − 18653.65 −(1)
= 59916.35 (1)
÷ 26 = $2304.48
Net fortnightly.

5. Explain the difference between Simple Interest and Compound Interest

[2]

Simple interest only has interest calculated on the principal amount. (1)

Compound interest has interested calculated on the principal plus the interest which accrues each compounding period. ie. Interest on the interest. (1)

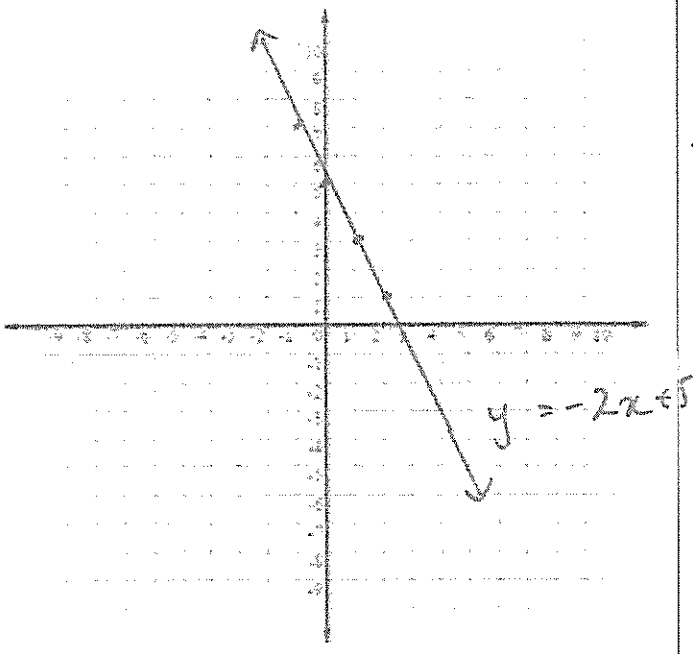
Linear Relationships

1. For the following equation, complete the table of values:

(a) $y = -2x + 5$ [2]

x	-1	0	1	2
y	7	5	3	1

(b) Graph the equation on the coordinate axis below. [2]



2. For the equation $y = \frac{1}{2}x + 2$,

(a) Find the y intercept [1]

2

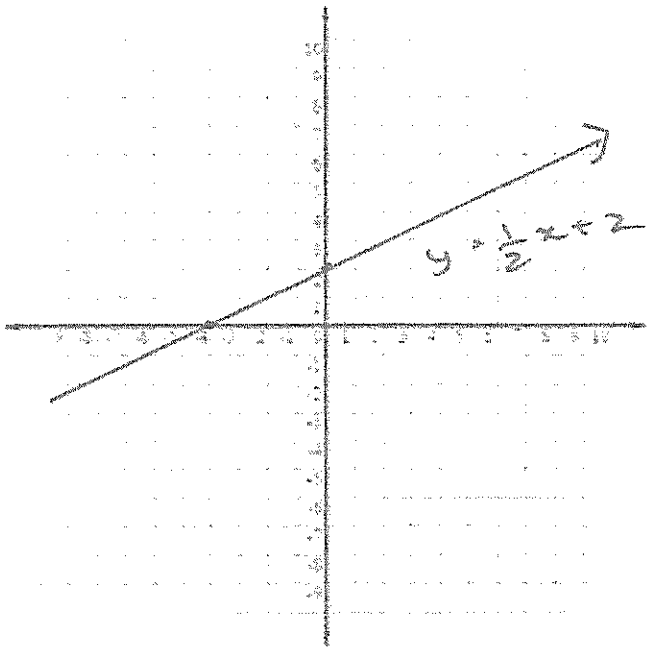
(b) Find the x intercept [2]

when $y = 0$

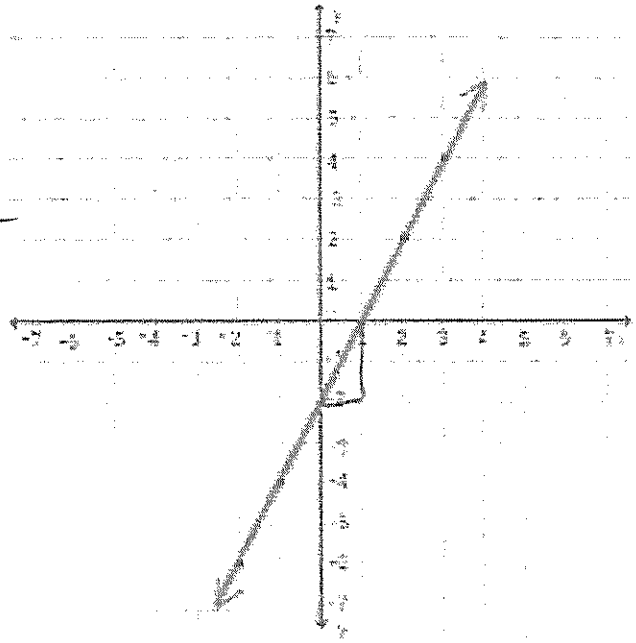
$0 = \frac{1}{2}x + 2$

$\frac{1}{2}x = -2$ $x = -4$

(c) (Continued) Use these results to graph the straight line. [2]



3. For the following straight line:



(a) Write down the gradient: [1]

2

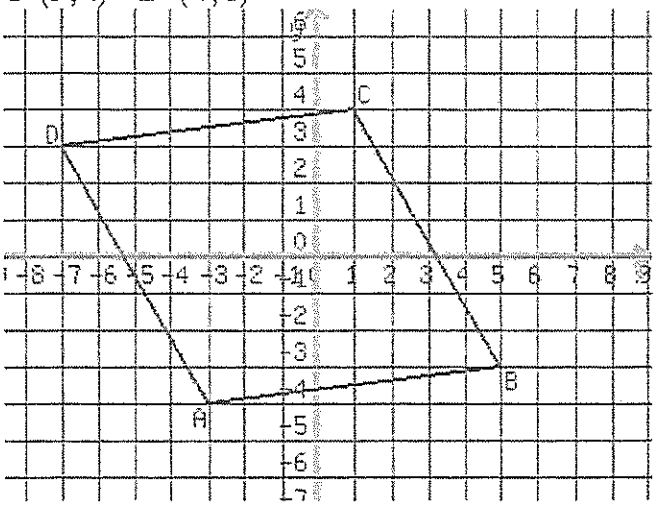
(b) Write down the y-intercept [1]

-2

(c) Write down the equation of the line [1]

$y = 2x - 2$

4. The following shape ABCD has A (-3, -4) B (5, -3) C (1, 4) D (-7, 3)



(a) Use the midpoint formula to show that the diagonals bisect each other. [3]

$M(AC) = \left(\frac{-3+1}{2}, \frac{-4+4}{2}\right)$

$= (-1, 0)$

$M(BD) = \left(\frac{5+-7}{2}, \frac{-3+3}{2}\right)$

$= (-1, 0)$

Since the midpoints are same, diagonals bisect

(b) Show that AD = DC [3]

$AD = \sqrt{(-3+7)^2 + (-4-3)^2}$

$= \sqrt{16+49}$

$= \sqrt{65}$

$DC = \sqrt{(-7-1)^2 + (3-4)^2}$

$= \sqrt{64+1}$

$= \sqrt{65}$

$= AD$

(c) (*) What shape is ABCD? Explain how you know. [2]

Rhombus because perpend diagonals Bisect and one pair of adjacent sides are equal.

5. (a) Does the point $(3, -2)$ lie on the line $2x + y - 7 = 0$?

$2 \times 3 + -2 - 7 = 0$

$6 - 9 = 0$

$-3 = 0$

NO [2]

(b) What is the gradient of the line $2x + y - 7 = 0$?

$y = -2x + 7$

$m = -2$ [2]

(c) What is the equation of the line parallel to $2x + y - 7 = 0$ which passes through the point $(3, 4)$?

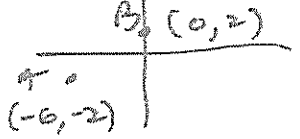
$M = -2$ through $(3, 4)$ [3]

$y - 4 = -2(x - 3)$

$y - 4 = -2x + 6$

$y = -2x + 10$

6. Show that the points $(-6, -2)$, $(0, 2)$ and $(3, 4)$ are collinear. [3]



$m(AB) = \frac{2+2}{0+6} = \frac{2}{3}$

$m(BC) = \frac{4-2}{3-0} = \frac{2}{3}$

Since $m(AB) = m(BC)$ The points are collinear.

END OF TEST

(Now check your work!)