

BERGVLiet HIGH SCHOOL
GRADE 10 P1 NOVEMBER 2012 MEMO

Question 1

1.1 Simplify:

1.1.1 $(x - 3y)(x + 2y)$ (2)
 $= x^2 - xy - 6y^2$ ✓✓

1.1.2 $\left(x - \frac{1}{2}\right)^2$ (2)
 $= x^2 - x + \frac{1}{4}$ ✓✓

1.1.3 $\frac{3^{x+2} - 3^x}{3^{x+1} + 3^{x+3}}$ (4)

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

$$= \frac{9 - 1}{3 + 27}$$

$$= \frac{8}{30}$$
 ✓

$$= \frac{4}{15}$$
 ✓

1.1.4 $\frac{5x - ax}{ay - 5y}$ (3)

$$= \frac{-x(a - 5)}{y(a - 5)}$$
 ✓

$$= -\frac{x}{y}$$
 ✓

1.2 Factorise fully:

1.2.1 $2x^2 + 5x - 12$ (3)
 $= (2x - 3)(x + 4)$ ✓ signs

1.2.2 $x^6 + 27y^3$ (3)
 $= (x^2 + 3y)(x^4 - 3x^2y + 9y^2)$ ✓✓

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Question 22.1 Solve for x :

2.1.1 $x^2 - 9x + 20 = 0$

$(x-4)(x-5) = 0 \checkmark$

$x = 4 \checkmark \text{ or } x = 5 \checkmark$

(3)

2.1.2 $\frac{3x}{5} - 2 = \frac{x}{3}$

$9x - 30 = 5x \checkmark$

$4x = 30 \checkmark$

$x = \frac{15}{2} \checkmark$

(4)

2.1.3 $-2(x+5) \geq 3$

$-2x - 10 \geq 3 \checkmark$

$-2x \geq 13$

$x \leq -\frac{13}{2} \checkmark$

(3)

2.1.4 $9^{x+3} = \frac{1}{27}$

$3^{2x+6} = 3^{-3} \checkmark$

$2x+6 = -3 \checkmark$

$2x = -9$

$x = -\frac{9}{2} = -4,5 \checkmark$

(4)

2.2

$x + y = 3$

$2x - 3y = -4$

$x = 3 - y \checkmark$

$2(3 - y) - 3y = -4 \checkmark$

$6 - 2y - 3y = -4$

$-5y = -10$

$y = 2 \checkmark$

$x = 3 - 2 \checkmark$

$x = 1 \checkmark$

(5)

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Question 3

3.1.1 15 ; 21 \checkmark

(1)

3.1.2 36; 49 \checkmark

(1)

$$3.2.1 \quad \begin{array}{cccc} 2 & 5 & 8 & 11 \\ & \swarrow & \swarrow & \swarrow \\ & 3 & 3 & 3 \end{array} \quad \checkmark \quad (4)$$

$$T_n = an + b$$

$$T_n = 3n + b \quad \checkmark$$

$$2 = 3(1) + b \quad \checkmark$$

$$\therefore b = -1$$

$$\therefore T_n = 3n - 1 \quad \checkmark$$

$$3.2.2 \quad T_n = 3n - 1 \quad (2)$$

$$T_{50} = 3(50) - 1 \quad \checkmark$$

$$T_{50} = 149 \quad \checkmark$$

$$3.2.3 \quad T_n = 3n - 1 \quad (2)$$

$$104 = 3n - 1 \quad \checkmark$$

$$n = 35 \quad \checkmark$$

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Question 4

$$4.1.1 \quad \begin{aligned} \text{Deposit} &= 6000 \times \frac{10}{100} \\ &= R600 \quad \checkmark \end{aligned} \quad (5)$$

$$\text{Amount owing} = R5400 \quad \checkmark$$

$$A = P(1 + in)$$

$$= 5400(1 + 0,21 \times 2) \quad \checkmark$$

$$= R7668 \quad \checkmark$$

$$\text{Monthly installments} = 7668 \div 24$$

$$= R319,5 \quad \checkmark$$

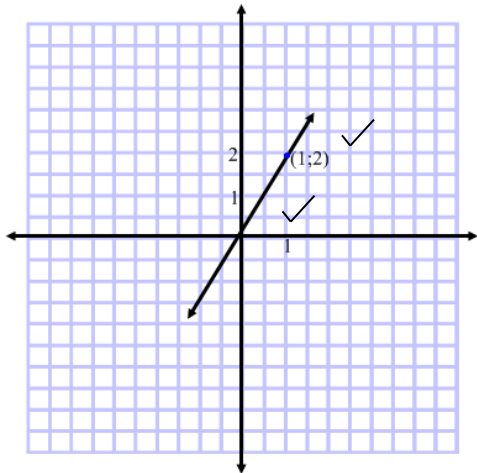
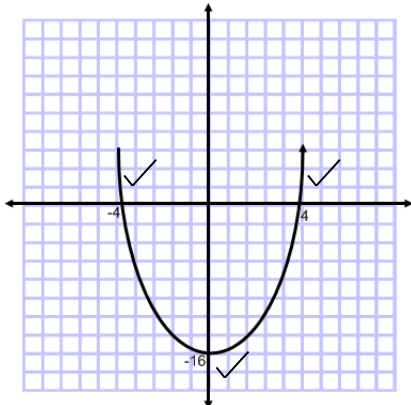
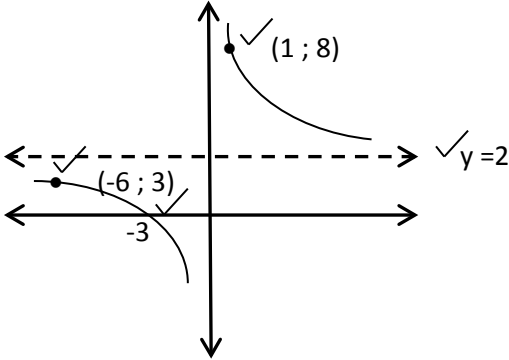
$$4.1.2 \quad 7668 + 600 \quad (1)$$

$$= R8268 \quad \checkmark$$

$$4.2 \quad \begin{aligned} A &= P(1 + i)^n \\ 15000 &= P(1 + .095)^4 \\ P &= \frac{15000}{(1 + .095)^4} \quad \checkmark \end{aligned} \quad (3)$$

$$P = 10433.61 \quad \checkmark$$

$$4.3 \quad \begin{aligned} A &= P(1 + i)^n \\ A &= 10000(1 + .11)^5 \cdot (1 + .095)^3 \\ A &= 22123.67 \quad \checkmark \end{aligned} \quad (4)$$

Question 5		
5.1.1	Function ✓	(1)
5.1.2	Not a function ✓	(1)
5.1.3	Function ✓	(1)
5.2.1	$f(-2) = 2(-2)^2 - 3$ ✓ $= 5$ ✓	(2)
5.2.2	$2f(x) + 3 = 2(2x^2 - 3) + 3$ ✓ $= 4x^2 - 6 + 3$ $= 4x^2 - 3$ ✓	(3)
5.3.1	$y = 2x$ 	(2)
5.3.2	$f(x) = x^2 - 16$ 	(3)
5.3.3	$y = \frac{6}{x} + 2$ 	(4)

5.4.1	$g(x) = a^x + q$ $-2 = a^{-1} - 4 \checkmark$ $2 = \frac{1}{a}$ $a = \frac{1}{2}$ $g(x) = \frac{1}{2}^x - 4 \checkmark$	(3)
5.4.2	$y = -4 \checkmark \checkmark$	(2)
5.4.3	<i>Domain</i> : $x \in R \checkmark$ <i>Range</i> : $y > -4 \checkmark$	(3)
5.4.4	$h(x) = 2^x - 4 \checkmark$	(1)
5.5.1	$g(x) = h(x)$ $x - 3 = 2x + 4 \checkmark$ $x = -7 \checkmark$ $y = -7 - 3 \checkmark$ $y = -10$ $\therefore (-7; -10) \checkmark$	(4)
5.5.2	$f(x) = ax^2 + q$ $y = ax^2 + 4 \checkmark$ $0 = a(-2)^2 + 4 \checkmark$ $-4 = 4a$ $a = -1$ $\therefore y = -x^2 + 4 \checkmark$	(3)
		[33]

Question 6

6.1		(4)
6.2	$\frac{450}{500} = \frac{9}{10} \checkmark$	(2)
6.3	$\frac{50}{500} = \frac{1}{10} \checkmark$	(2)
		[8]