Gr 10 2021 Final Assessment P I memo

Question 1

1.1.1) 5 ✓
1.1.2) 6 ✓
1.1.3) 7 ✓

(3)

1.2) $18 - 4x < 0$ ✓
$-4x < -18$
$x > \frac{9}{2}$ ✓

(2)

1.3) $100x = 12,12$ ✓
$x = 0,12$
$99x = 12$
$x = \frac{12}{99}$ ✓
$x = \frac{4}{33}$ ✓

(3)

1.4) $\left(3x - \frac{3}{x}\right)^2 = 5^2$ ✓
$9x^2 - 18 + \frac{9}{x^2} = 25$
$9x^2 + \frac{9}{x^2} = 43$ ✓

(2)

Question 2

2.1.1) $3(a-1)x^2 - 10(a-1)xy - 8(a-1)y^2$ ✓
$= (a-1)[3x^2 - 10xy - 8y^2]$ ✓
$= (a-1)(x-4y)(3x+2y)$ ✓

(3)

2.1.2) $3x(x+y) - 2z(x+y)$ ✓
$= (x+y)(3x-2z)$ ✓

(2)

2.2.1) $27x^3 - y^3$ ✓

(1)

2.2.2) $\frac{2^x}{2^x - \frac{3.2^x}{2^x}.2^{-1}}$
$= \frac{2^x}{2^x(1-3.2^{-1})}$ ✓
$= -2$ ✓

(2)

2.2.3) $\frac{x-1}{x-1} - 2$
$= \frac{x-3-2(x-1)}{x-1}$ ✓num
$= \frac{x-3-2x+2}{x-1}$
$= \frac{-x-1}{x-1}$ ✓num
$= -\frac{x+1}{x-1}$ ✓den

(3)

Question 3

3.1.1) $4.3^{-1}.3^{2x} - 8 = 0$
$\frac{4}{3}.3^{2x} = 8$
$3^{2x} = 6$ ✓
$2x = \frac{\log 6}{\log 3}$ ✓show logs
$2x = 1,6309...$
$x = 0,82$ ✓

$3^{2x-1} = 2$ ✓
$2x - 1 = \frac{\log 2}{\log 3}$ ✓
$x = 0,82$ ✓

(3)

3.1.2) $x^2 + 5x = 6$
$x^2 + 5x - 6 = 0$ ✓
$(x+6)(x-1) = 0$ ✓both
$x+6=0$ or $x-1=0$
$x = -6$ or $x = 1$ ✓both

(3)

3.2.1) $-4 \leq \frac{1}{2}m + 1 < 5$
$-5 \leq \frac{1}{2}m < 4$ ✓
$-10 \leq m < 8$ ✓

(2)

3.2.2) $m \in [-10; 8)$ ✓

(1)

3.3) $3x - 2y = -27$ (1)
$-y + 2x = 9$ (2)
$y = 2x - 9$ (3) from (2) ✓
$3x - 2(2x-9) = -27$ ✓
$3x - 4x + 18 = -27$
$x = 45$ ✓

$y = 2(45) - 9$
$y = 81$ ✓

$\therefore x = 45$
$y = 81$

(4)

Question 4

4.1.1) $T_n = a + (n-1)d$ ✓$d = -6$

$= 8 + (n-1)(-6)$ ✓sub a & d into formula

$T_n = 14 - 6n$ ✓simplify a.o. 3/3 (3)

4.1.2) $T_{13} = 14 - 6(13)$

$= -64$ ✓ (1)

4.1.3) $-5242 = 14 - 6n$

$6n = 5256$

$n = 876$ ✓

Yes, it is the 876^{th} term. (2)

4.2) $7 - (x-3) = 3x - 1 - (7)$ ✓

$-x + 10 = 3x - 8$

$-4x = -18$

$x = \frac{9}{2}$ ✓ (3)

4.3) $\sqrt{2}; \pi; -8; -1; 6; 13; \ldots; 643$

$a = -8 \quad d = 7$ ✓

$T_n = a + (n-1)d$

$643 = -8 + (n-1)(7)$ ✓f+s

$n = 94$ ✓

$\therefore$ 96 terms in the sequence ✓ (4)

Question 5

5.1.1) $15\% \times 15000 = R2250$ ✓ (1)

OR

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

$= 12750\left(1 + \frac{9}{1200} \times 36\right)$ ✓f+s $12750\left(1 + \frac{9}{100} \cdot 3\right)$

$= R16192,50$

$M = \frac{16192}{36}$ ✓ $+ 6,75$ ✓ ÷36 +insurance

$= R456,54$ ✓ (4)

5.2) $T_0 \to T_5$ $A = 10000\left(1 + \frac{3}{1200}\right)^5$ ✓

$= 10125,6265\ldots$

$+ 5000$

$= 15125,6265$ ✓+5000

$T_5 \to T_6$ $A = 15125,6265\ldots\left(1 + \frac{3}{1200}\right)^1$ ✓

$= 15163,4606\ldots$

$T_6 \to T_{12}$ $A = 15163,4606\ldots\left(1 + \frac{4,5}{400}\right)^2$ ✓

$A = R15506,54$ ✓ (7)

OR

10 000 $A = 10\,000\left(1 + \frac{3}{1200}\right)^6\left(1 + \frac{4,5}{400}\right)^2$ ✓ ✓

$= 10\,380,62\ldots$

5 000 $A = 5000\left(1 + \frac{3}{1200}\right)^1\left(1 + \frac{4,5}{400}\right)^2$ ✓

$= 5125,91\ldots$

$\therefore 10\,380,62\ldots + 5125,91\ldots$

$= R\,15\,506,54$ ✓

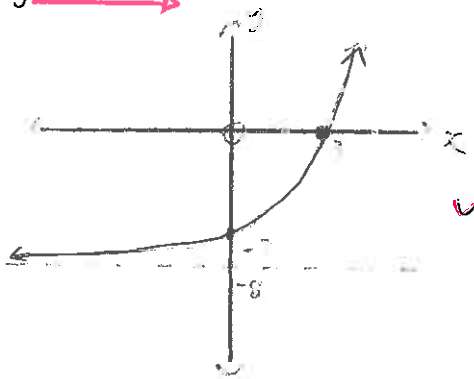
Question 6

6.1) $y = -8$ ✓ → $q = -8$ ✓ (1)

6.2.1) $0 = 2^x - 8$ ✓
$2^x = 8$
$x = 3$ ✓ (2)

6.2.2) $y = 2^0 - 8$
$y = -7$ ✓ (1)

6.3)



✓ shape (1)

6.4) f: $y = 2^x - 8$

g: $-y = 2^x - 8$ ref x-axis
$y = -2^x + 8$ ✓
$y = -2^x + 6$ ✓ ↓2 (2)

Question 7

7.1) $A(-2;0)$ ✓
$B(2;0)$ ✓ (2)

7.2.1) $10 = a(3-2)(3+2)$ ✓ sub (3;10)
$10 = 5a$
$a = 2$ ✓ (2)

7.2.2) $m = \frac{10-0}{3-(-2)}$ ✓ $A(-2;0)$ $E(3;10)$
$m = 2$ ✓ (2)

7.2.3) $y = 2x + c$
$0 = 2(-2) + c$ ✓ sub (-2;0) or (3;10)
$c = 4$ ✓ (2)

7.3) $y = 2(x-2)(x+2)$
$y = 2x^2 - 8$
$C = (0;-8)$ $y_C = -8$ ✓
$D = (0;4)$ $y_D = 4$ ✓ CA 7.2.3
$CD = 4 - (-8)$
$CD = 12$ ✓ (3)

7.4.1) $x > 0$ OR $x \in (0;\infty)$ ✓A (1)

7.4.2) $f(x) - g(x) < 0$
$f(x) < g(x)$
$-2 < x < 3$ OR $x \in (-2;3)$ ✓A (1)

7.4.3) $x = -2$ ✓A or $x \in [2;\infty)$ ✓A (2)

and ; -1 NB or

Question 8

8.1) $c = -1$ ✓ (1)

8.2) $y = \frac{k}{x} - 1$

$8 = \frac{k}{-1} - 1$ ✓ sub $(-1; 8)$

$9 = \frac{k}{-1}$

$k = -9$ ✓ (2)

8.3) $\frac{-9}{x} - 1 = -x - 1$ ✓

$-9 - x = -x^2 - x$

$x^2 = 9$ ✓

$x = \pm 3$ ✓

$y_A = -(-3) - 1$

$= 2$

$A(-3; 2)$ ✓ ✓ (5)

8.4) $y \in \mathbb{R}; y \neq -1$ OR $y \in (-\infty; -1) \text{ or } (-1; \infty)$ ✓ (1)

CA from 8.1

✓

Sol:

Question 9

9.1 (a) $P(B) + P(B') = 1$

$P(B) + 0,7 = 1$

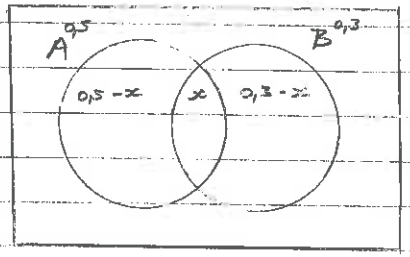
$P(B) = 0,3$ ✓ (1)

(b) $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

$0,6 = 0,5 + 0,3 - P(A \text{ and } B)$ ✓

$P(A \text{ and } B) = 0,2$ ✓ (2)

9.2



$0,5 - x + x + 0,3 - x = 0,6$ ✓

$0,2 = x$ ✓

9.2 (a) $P(X) = 0,5$ ✓ (1)

(b) $P(Y) = 0,7$ ✓ (1)

(c) $P(X \cap Y') = 0,4$ ✓ (1)

(d) $P(X \cup Y')$

$= 0,5 + 0,3 + 0$

$= 0,8$ ✓ (1)

9.2.2 No ✓ $A \cap B \neq \emptyset$ ✓R

$P(A \cap B) \neq 0$ (2)

9.3.1 2 ✓ (1)

9.3.2 20 ✓ (1)

9.3.3 18 ✓ (1)

9.3.4 3 ✓ (1)