

GR 12 MATHS – EXAM MEMOS

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NATIONAL NOV 2014 PAPER 1

► ALGEBRA AND EQUATIONS AND INEQUALITIES [21]

1.1.1 $(x-2)(4+x) = 0$

$$\begin{aligned} \therefore x-2 &= 0 & \text{or} & & 4+x &= 0 \\ \therefore x &= 2 & & & x &= -4 \end{aligned}$$

1.1.2 $3x^2 - 2x - 14 = 0$

$$\therefore x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(3)(-14)}}{2(3)}$$

$$\therefore x = \frac{2 \pm \sqrt{172}}{6}$$

$$\therefore x = 2,52 \text{ or } -1,85 <$$

1.1.3 $2^{x+2} + 2^x = 20$

$$\therefore 2^x \cdot 2^2 + 2^x = 20$$

$$\therefore 2^x(4 + 1) = 20$$

$$+5) \quad \therefore 2^x = 14$$

$$\therefore x = 2 <$$

1.2 $x = 2y + 3 \quad \dots \textcircled{1}$

$$3x^2 - 5xy = 24 + 16y \quad \dots \textcircled{2}$$

$$\textcircled{1} \text{ in } \textcircled{2}: \therefore 3(2y+3)^2 - 5y(2y+3) = 24 + 16y$$

$$\therefore 3(4y^2 + 12y + 9) - 10y^2 - 15y - 24 - 16y = 0$$

$$\therefore 12y^2 + 36y + 27 - 10y^2 - 15y - 24 - 16y = 0$$

$$\therefore 2y^2 + 5y + 3 = 0$$

$$\therefore (2y + 3)(y + 1) = 0$$

$$\therefore 2y + 3 = 0 \text{ or } y + 1 = 0$$

$$\therefore 2y = -3 \quad \therefore y = -1$$

$$\therefore y = -1$$

$$\textcircled{1}: \text{ For } y = -\frac{3}{2}: x = 2\left(-\frac{3}{2}\right) + 3 = -3 + 3 = 0$$

$$\& \text{ For } y = -1: x = 2(-1) + 3 = -2 + 3 = 1$$

$$\therefore \text{The solution: } \left(0, -\frac{3}{2}\right) \text{ or } (1, -1) <$$



1.3 $(x-1)(x-2) < 6$

$$\therefore x^2 - 3x + 2 - 6 < 0$$

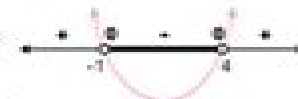
$$\therefore x^2 - 3x - 4 < 0$$

$$\therefore (x+1)(x-4) < 0$$

The expression:

 $x:$

$$\therefore -1 < x < 4 <$$



1.4 The roots are real when

$$-b-4 \geq 0 \quad \dots \Delta \geq 0$$

$$\therefore -b \geq 4$$

$$b \leq -4 \quad \therefore b \leq -4 <$$



► PATTERNS AND SEQUENCES [31]

2. $2 + 9 + 16 + \dots$ (to 251 terms)

2.1 $T_n = 2n - 5$

2.2 A.S.: $T_{251}?$: $a = 251$: $a = 2$: $d = 7$

$$T_n = a(n-1)d + T_1 \quad \therefore T_{251} = 2 + (251-1)(7) = 1752 <$$

$$\text{OR: It is a linear sequence: } T_n = an + b$$

$$\text{where } a = 7 \text{ and } b = T_1 - 5$$

$$\therefore T_n = 7n - 5$$

$$\therefore T_{251} = 7(251) - 5 = 1752 <$$

2.3 $\sum_{n=1}^{251} (7n - 5) < \dots$ if you found T_n in 2.2

$$\text{OR: } \sum_{n=1}^{251} (7n - 5) <$$


OR: Find T_n using the A.S. formula

$$T_n? : a = 2 : d = 7$$

$$T_n = a + (n-1)d \quad \therefore T_n = 2 + (n-1)(7) = 2 + 7n - 7 = 7n - 5$$

Then, sigma notation, as above.

2.4 $S_n = \frac{n}{2}(a + T_n)$, where $n = 251$: $a = 2$: $T_n = 1752$

$$\therefore S_{251} = \frac{251}{2}(2 + 1752) = 220127 <$$

OR:

$$S_n = \frac{n}{2}[2a + (n-1)d]$$
, where $n = 251$: $a = 2$: $d = 7$

$$\therefore S_{251} = \frac{251}{2}[2(2) + (251-1)(7)] = 220127 <$$

2.5 $2 + 9 + 16 + 25 + 36 + 49 + 64 + 81 + 100 + \dots$

Consider the series: $16 : 49 : 100 : \dots$

$$a? : T_n = 1752 \text{ (divisible by 4)} : a = 16 : d = 28$$

$$a + (n-1)d = T_n \quad \therefore 16 + (n-1)(28) = 1752$$

$$\therefore (n-1)(28) = 1736$$

$$\therefore n-1 = 62$$

$$\therefore n = 63$$

$$\therefore 63 \text{ terms} <$$

OR: By inspection, after 16 every 4th term is divisible by 4. So, imagining T_1 to be inserted at the start, determine the number of groups of 4 terms up to T_{251} .

$$\text{The number of groups} = \frac{252}{4} \dots 1 + 251 = 63$$

$$\therefore 63 \text{ terms divisible by 4} <$$

EXAM MEMOS: PAPER 1

Grade 12 2014 Exemplars

Shasha Hu



Grade 12 2014 Exemplars:

Grade 12 2014 Exemplars Book Review: Unveiling the Magic of Language

In an electronic era where connections and knowledge reign supreme, the enchanting power of language has become more apparent than ever. Its power to stir emotions, provoke thought, and instigate transformation is actually remarkable. This extraordinary book, aptly titled "**Grade 12 2014 Exemplars**," published by a highly acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound impact on our existence. Throughout this critique, we shall delve in to the book is central themes, evaluate its unique writing style, and assess its overall influence on its readership.

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