Form Three Mathematics Test (2023–2024)
Ch.3 Linear Inequalities in One Unknown

Class: F . 3 (   )   Name: _____ (   )

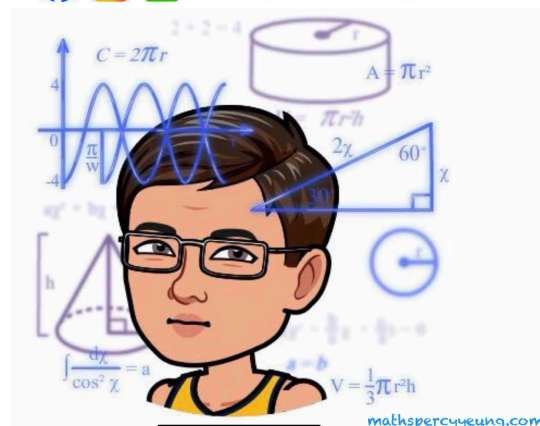|			
Time Allowed: 30 minutes	**Mark**	**/40**	**Class Average**
Date: 20/10/2023	**Parent's Signature:**		

Unless specified, the figures are not necessary drawn to scale.
Section A: Multiple Choice (12 marks)

1. The smallest negative integer satisfying the inequality $x \geq -\sqrt{200}$ is

    A. -15.
    B. -14.
    C. -13.
    D. -12.

2. If h and k are non-zero constants such that $\dfrac{h}{k} > 0$, which of the following must be true?

    I. $hk > 0$

    II. $h - k > 0$

    III. $h\left(\dfrac{1}{k}\right) + k\left(\dfrac{1}{h}\right) > 0$

    A. I only
    B. II only
    C. I and III only
    D. II and III only

3. If $m < n$ and $k < 0$, which of the following must be true?

    I. $m - k < n - k$

    II. $-km < -kn$

    III. $\dfrac{m}{k^2} < \dfrac{n}{k^2}$

    A. I and II only
    B. I and III only
    C. II and III only
    D. I, II and III

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4. If $m \le n$, the solutions of the inequality $mx + n \le m + nx$ are

A. $x \ge 1$.
B. $x \le 1$.
C. $x > 1$.
D. $x < 1$.

5. If $-4a > b$ and $c > -3a$, then

A. $b < \dfrac{3}{4}c$.

B. $b > \dfrac{3}{4}c$.

C. $b < \dfrac{4}{3}c$.

D. $b > \dfrac{4}{3}c$.

6. The height of a trapezium is 5 cm. The upper base of the trapezium is 4 cm shorter than its lower base. If the area of the trapezium is at most 50 cm^2, the maximum length of the upper base of the trapezium is

A. 7 cm.

B. 8 cm.

C. 11 cm.

D. 12 cm.

Section B: Short Questions (9 marks)

	Question	Answer
7.	Fill in the blanks with appropriate inequality signs '>', '<', '≥' or '≤'. (a) If $a < b$ and $b < 4$, then a _____ 4. (c) If $p > q$ and $-6 < q$, then p _____ -6. (d) If $m \le 3$ and $3 \le n$, then n _____ m.	(a) (b) (c)
8.	If $m \ge n$, fill in the blanks with appropriate inequality signs '≥' or '≤'. (a) $4m + 1$ _____ $4n + 1$ (b) $5 - 2m$ _____ $5 - 2n$ (c) $-\dfrac{1+5m}{6}$ _____ $-\dfrac{1+5n}{6}$	(a) (b) (c)
9.	If $x < y < 0$, fill in the blanks with appropriate inequality signs '>' or '<'. (a) x^2 _____ xy (b) xy _____ y^2 (c) x^2 _____ y^2	(a) (b) (c)

Section C: Long Questions (19 marks)

10. **(a)** Solve the inequality $\dfrac{4x-11}{3} < 5x$ and represent the solutions graphically. (2 marks)

    (b) Write down the smallest possible integer that satisfies the inequality in (a). (1 mark)

11. **(a)** Solve the inequality $\dfrac{15-x}{2} - \dfrac{3x+5}{4} \geq 0$. (3 marks)

    (b) How many positive integers are there satisfying the inequality in (a)? (1 mark)

12. In a group of scouts, there are x boys. The number of girls is greater than the number of boys by 5. If the total number of scouts in the group is not more than 30,
   (a) set up an inequality in x,
   (b) find the greatest possible value of x satisfies the inequality in (a).

   (3 marks)

13. If the sum of three consecutive odd numbers is greater than 190, find the smallest possible value of the largest number.

   (4 marks)

14. There are 20 multiple choice questions in a test. 5 marks will be awarded to each correct answer while 1 mark will be deducted from each wrong or blank answer. It is given that the passing mark of the test is 50.
    (a) At least how many questions have to be answered correctly to pass the test?
    (b) Ben has answered all questions in the test. By using the result of (a), if Ben answers 7 questions wrongly, can he pass the test? Explain your answer.

    (5 marks)

Section D: Bonus (2 marks) Only answers are required.

15. The sum of all interior angles of a polygon is greater than 2000°. At least how many sides does the polygon have?