Part I. Multiple Choice. Directions: Place the answers to the questions in the boxes below.

1.	2.	3.	4.	5.	6.	7.
4	**4**	**1**	**4**	**3**	**2**	**3**

1) Which inequality is equivalent to $\dfrac{3x}{2} - 6 < 9$?

$$\frac{3x}{2} - 6 < 9$$

$$\frac{3x}{2} < 15$$

$$\frac{2}{3} \bullet \frac{3x}{2} < 15 \bullet \frac{2}{3}$$

$$x < 10$$

   (1) $x < 7$ (3) $x < 2$

   (2) $x < 8$ **(4)** $x < 10$

2) For which value of **x** is $\dfrac{1}{x-9}$ undefined?

   (1) -9   (2) 3   (3) 0   **(4)** 9 $\dfrac{1}{9-9} = \dfrac{1}{0}$

3) Solve for **x**: $\dfrac{x}{2} = \dfrac{3x-1}{5}$

   (1) 2   (3) -2

   (2) 1   (4) -1

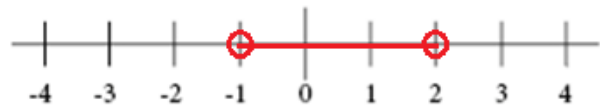$2(3x - 1) = 5x$
$6x - 2 = 5x$
$-2 = -x$
$2 = x$

4) The sum of two consecutive integers is 62. Which equation **cannot** be used to solve this problem?

   (1) $x + (x + 1) = 62$ (3) $(x - 1) + x = 62$

   (2) $(x + 5) + (x + 6) = 62$ **(4)** $(x - 4) + (x - 2) = 62$

$x - 4$ and $x - 2$ are consecutive even or odd integers because the pattern is +2

5) Which compound inequality statement represents the solution set graphed below?

   (1) $-1 \leq x \leq 2$ **(3)** $-1 < x < 2$

   (2) $-1 > x > 2$ (4) $-1 < x > 2$

6) Evaluate $\frac{1}{4} km^2$ when **k = -5** and **m = -6**

   (1) 45   **(2)** -45   (3) 225   (4) 56.25

$\frac{1}{4}$ (-5)(-6)^2
$\frac{1}{4}$ (-5)(36)
9(-5)
-45
Put all negative numbers in ( )

7) For which value of **M** and **N** is **M + N** a rational number?

(1) $M = \dfrac{1}{\sqrt{2}}$ and $N = \dfrac{1}{\sqrt{10}}$

(3) $M = \dfrac{1}{\sqrt{4}}$ and $N = \dfrac{1}{\sqrt{9}}$

(2) $M = \dfrac{1}{\sqrt{6}}$ and $N = \dfrac{1}{\sqrt{4}}$

(4) $M = \dfrac{1}{\sqrt{10}}$ and $N = \dfrac{1}{\sqrt{25}}$

$$\dfrac{1}{\sqrt{4}} = \dfrac{1}{2}$$

$$\dfrac{1}{\sqrt{9}} = \dfrac{1}{3}$$

$$\dfrac{1}{2} + \dfrac{1}{3} = \dfrac{5}{6} \leftarrow rational$$

Part II. Extended Response. Show all necessary work.

8) Solve for **x**:

a) $ax + 3b = 2f$

 -3b -3b

$\dfrac{ax}{a} = \dfrac{2f - 3b}{a}$

$x = \dfrac{2f - 3b}{a}$

b) $y = \dfrac{1}{2}px^2$

$2y = \cancel{2} \bullet \dfrac{1}{\cancel{2}}px^2$

$2y = px^2$

$\dfrac{2y}{p} = \dfrac{\cancel{p}x^2}{\cancel{p}}$

$\dfrac{2y}{p} = x^2$

$\sqrt{\dfrac{2y}{p}} = x$

9) Given $2x + ax - 7 > -12$, determine the largest *integer* value of a when $x = -1$.

$2(-1) + a(-1) - 7 > -12$

$-2 - a - 7 > -12$

$-a - 9 > -12$

$\dfrac{-a}{-1} > \dfrac{-3}{-1}$

$a < 3$

The value of **a** that will make the inequality true is any number less than 3 so the <u>largest integer</u> value that **a** could represent is **2**.

Check: *2 as the integer*
$2(-1) + \mathbf{2}(-1) - 7 > -12$
$-11 > -12$ **True**

Check: *3 as the integer*
$2(-1) + \mathbf{3}(-1) - 7 > -12$
$--12 > -12$ **False**

10) Jack is 27 years older than Susan. In 5 years' time he will be 4 times as old as she is then. Find Jack and Susan's present age.

x: Susan's age now

x + 27: Jack's age now

In 5 years…what do Susan and Jack look like?

Future Susan: x + 5

Future Jack: x + 27 + 5 →x + 32

He (*future Jack*) will be **4 times as old** as her (*future Susan*)

$x + 32 = 4(x + 5)$ → Future Jack = 4 (Future Susan)

$x + 32 = 4x + 20$

$32 = 3x + 20$

$12 = 3x$

$4 = x$ Susan is 4 yrs old and Jack is 31 yrs old.