

Name: _____

Date: _____

TOTAL = $\frac{\quad}{60} = \frac{\quad}{100}$

563306 – Mathematics – Unit 3 – Equations and Inequalities
Practice Test - Version B

PART 1: MULTIPLE CHOICE (EACH QUESTION IS WORTH 4 MARKS)

1

Determine the interval which represents the solution set of the inequality

4 | 0

$$\frac{5x+1}{-6} \geq \frac{3}{2}$$

A) $]-\infty, -2]$

C) $[-2, +\infty[$

B) $] -\infty, -2[$

D) $] -2, +\infty [$

2

Given the following equation:

4 | 0

$$\frac{4x-3}{5} = \frac{2x+9}{3} - 4$$

What is the value of x in the equation?

A) 3

C) 25

B) -3

D) 4

3

In which of the following equations does x equal a positive integer?

4 | 0

A) $3x - 4 = -31$

C) $\frac{x+4}{3} = 1$

B) $3x + 2 = -x - 14$

D) $4(x - 3) = 8$

4

Which one of the following inequalities is equivalent to $x \leq -5$?

4 | 0

A) $-3x + 10 \leq 25$

C) $-4x - 7 \geq 13$

B) $-3x \leq 15$

D) $x - 2 \leq 3x + 8$

5

What is the solution of the following equation?

4 | 0

$$4(3x + 2) - 2(4x - 1) = 2(x + 12)$$

A) $S = \{7\}$

C) $S = \left\{\frac{17}{3}\right\}$

B) $S = \{5.5\}$

D) $S = \{1\}$

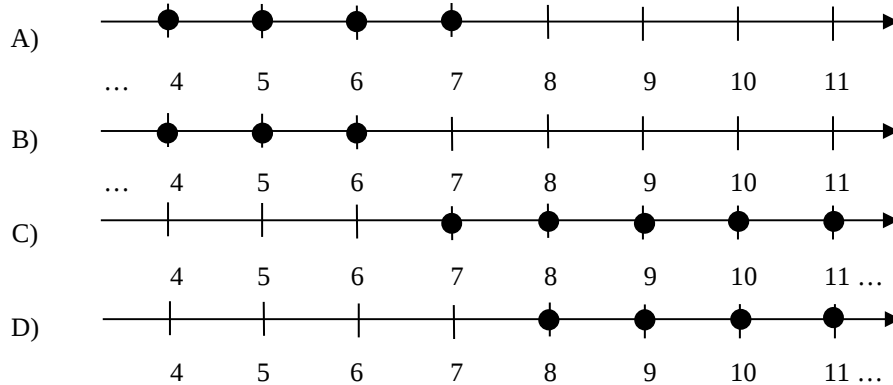
6

Given the following inequality, where $n \in \mathbb{Z}$,

4 | 0

$$4n + 23 \leq 47$$

which one of the following graphs corresponds to the solution set of this inequality?

**PART 2: SHORT ANSWERS (EACH QUESTION IS WORTH 4 MARKS)**

7

Solve for x in each of the following equations:

a) $2x + 5 - 6x = 3$

b) $4x + 7 = -3x - 7$

4 | 3 | 2 | 1 | 0

$x = \underline{\hspace{2cm}}$

$x = \underline{\hspace{2cm}}$

8

Solve for x in each of the following equations:

a) $\frac{x}{2} - 7 = -2$

b) $6 + \frac{x}{4} = -\frac{x}{2}$

4 | 3 | 2 | 1 | 0

$x = \underline{\hspace{2cm}}$

$x = \underline{\hspace{2cm}}$

9

Solve the following inequality and give the solution set in **interval notation**.

4 | 3 | 2 | 1 | 0

$$-8(x - 2) \geq 2(2x + 4) + 44$$

Answer: $\underline{\hspace{2cm}}$

10 Match each real number line solution with the correct inequality.

4 | 3 | 2 | 1 | 0

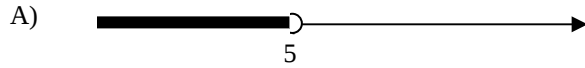
1) $4x - 7 < 37$

2) $6x \geq 24$

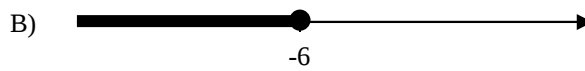
3) $-5x + 3 \geq 33$

4) $3x - 15 < 0$

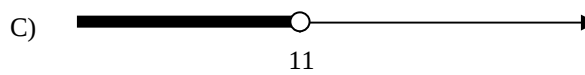
Write the equation numbers matching the solutions on the lines below:



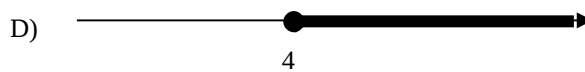
A) _____



B) _____



C) _____



D) _____

PART 3: EXTENDED ANSWERS (EACH QUESTION IS WORTH 10 MARKS)

10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0

11 The length of a rectangular field measures 10 meters less than twice the width. If the perimeter measures at least 148 meters, determine the minimum width of the field.

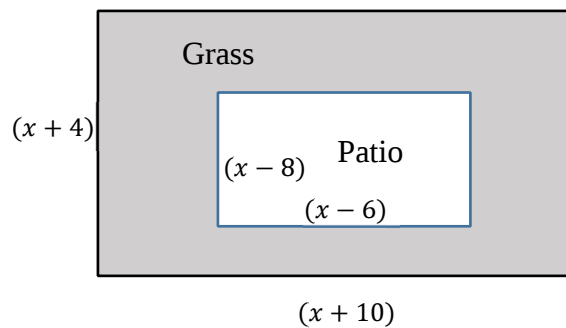
Show all your work.

Answer: The minimum width of the field is _____ meters.

- 12 The Brown family decides to cover the patio of their backyard with wooden planks worth \$6.50 each. Each plank is in the shape of a rectangle with dimensions 2.5 meters by 0.1 meters.

If the area of the backyard occupied by grass is equal to 328 m^2 (shaded in the figure shown below), what is the cost of the wooden planks to cover the patio?

Show all your work.



Answer: The cost of the wooden planks is \$_____.

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1

C

3

D

5

A

2

B

4

C

6

B

7

a) $x = 0.5$ b) $x = -2$

8

a) $x = 10$ b) $x = -24/5$ or -4.8

9

$]-\infty, -3]$

10

- A) 4
- B) 3
- C) 1
- D) 2

11

Let x represent the width of the field.

Length of the field $= 2x - 10$

Perimeter of the field $= 2x - 10 + 2x - 10 + x + x = 6x - 20$

$$\begin{array}{r} 6x - 20 \geq 148 \\ +20 \quad +20 \\ \hline 6x \geq 168 \\ \div 6 \quad \div 6 \\ \hline x \geq 28 \end{array}$$

Answer: They width of the field is at least 28 meters.

12

Area of the backyard $= (x + 10)(x + 4) = x^2 + 14x + 40$

Area of the patio $(x - 8)(x - 6) = x^2 - 14x + 48$

Area of grass $= (x^2 + 14x + 40) - (x^2 - 14x + 48)$
 $= x^2 + 14x + 40 - x^2 + 14x - 48$
 $= 28x - 8$

Finding x because we know that grass area is 328 m^2

$$\begin{array}{r} 28x - 8 = 328 \\ +8 \quad +8 \\ \hline 28x = 336 \\ \div 28 \quad \div 28 \\ \hline x = 12 \end{array}$$

Length of the patio $= x - 6 = 12 - 6 = 6$

Width of the patio $x - 8 = 12 - 8 = 4$ Area

of the patio $= l \times w = 6 \times 4 = 24 \text{ m}^2$

Area of a wooden plank $= l \times w = 2.5 \times 0.1 = 0.25 \text{ m}^2$

Number of wooden planks needed $= 24 \div 0.25 = 96$ planks

Cost to cover the patio $= 96 \times 6.50 = \$624$

Answer: The cost of the wooden planks is \$624.