



DEPARTMENT OF EDUCATION

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*Working Together for Student Success*

# ISTEP+ Grade 10 Sample Items

## Mathematics Part 2

Which quadratic equation could be used to find the zeros of  $f(x) = x^2 + 13x - 30$ ?

A.  $(x - 15)(x + 2) = 0$

B.  $(x + 10)(x + 3) = 0$

C.  $(x + 15)(x - 2) = 0$

D.  $(x - 10)(x - 3) = 0$

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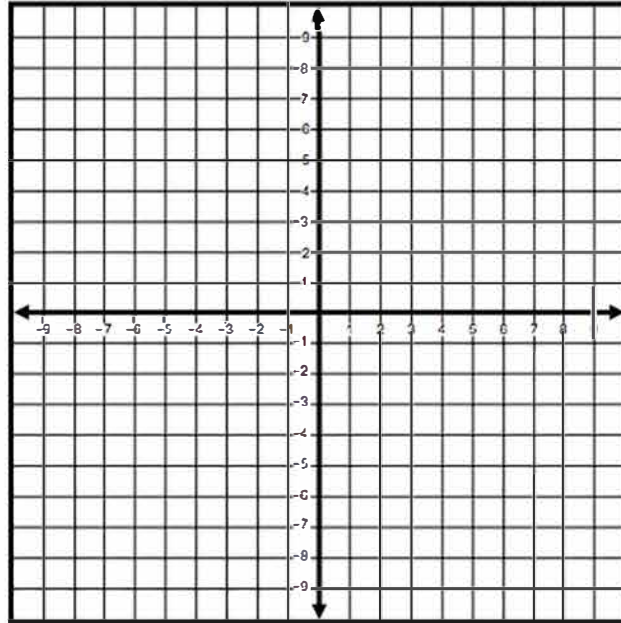
Show the graph of  $y = 3x^2 - 6x + 1$  on the coordinate plane.

Choose the type of graph. Drag the two points to the correct position.

Linear

Quadratic

Exponential



Quadrilateral  $PQRS$  has sides of different lengths.

- Side  $PQ$  is the LONGEST side with a length of  $\sqrt{75}$  inches.
- Side  $RS$  is the SHORTEST side with a length of  $\frac{\sqrt{45}}{2}$  inches.
- Side  $QR$  has a length of  $\sqrt{55}$  inches.

**Part A**

Which numbers represent possible lengths, in inches, of side  $PS$ ? Select ALL that apply.

- A.  $\sqrt{6}$
- B.  $3\sqrt{10}$
- C.  $\sqrt{14}$
- D.  $\frac{\sqrt{50}}{2}$
- E.  $2\sqrt{40}$

**Part B**

Plot a segment on the number line so that the values of the endpoints represent the side lengths for  $PQ$  and  $RS$  to the nearest half-unit. Select the solution set indicator. Drag the point(s) on the indicator to the appropriate location(s) on the number line.



Ravi bought a liquid fertilizer for his vegetable plants.

**Part A**

He mixes  $\frac{1}{4}$  ounce of fertilizer into each cup of water. Complete the table to show the number of ounces of fertilizer used for different numbers of cups of the mixture.

Select the numbers you want to choose and drag them into the columns.

- 9    $1\frac{1}{2}$    4    $3\frac{3}{4}$     $4\frac{1}{2}$    12    $3\frac{1}{2}$    8

**Fertilizer Mixture**

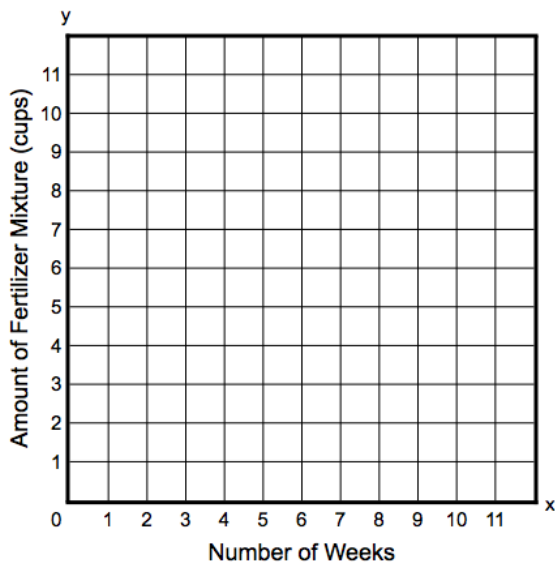
| Number of Cups of the Mixture | Number of Ounces of Fertilizer |
|-------------------------------|--------------------------------|
| 3                             | $\frac{3}{4}$                  |
| 6                             | <input type="text"/>           |
| <input type="text"/>          | $2\frac{1}{4}$                 |
| <input type="text"/>          | 3                              |
| 15                            | <input type="text"/>           |
| 20                            | 5                              |

**Part B**

The instructions on the bottle of fertilizer indicate that each plant should be fertilized with  $\frac{1}{2}$  cup of the fertilizer mixture every week. Ravi wrote the equation  $y = \frac{1}{2}x$ . Create a graph that models the total number of cups of fertilizer mixture used for several weeks.

Select two points on the coordinate plane. A line will connect the two points.

**Fertilizer for One Plant**



**Part C**

Ravi has 13 plants. Based on the equation  $y = \frac{1}{2}x$ , what is the total number of cups of fertilizer mixture that he will have used at the end of week 16?

Answer  cups