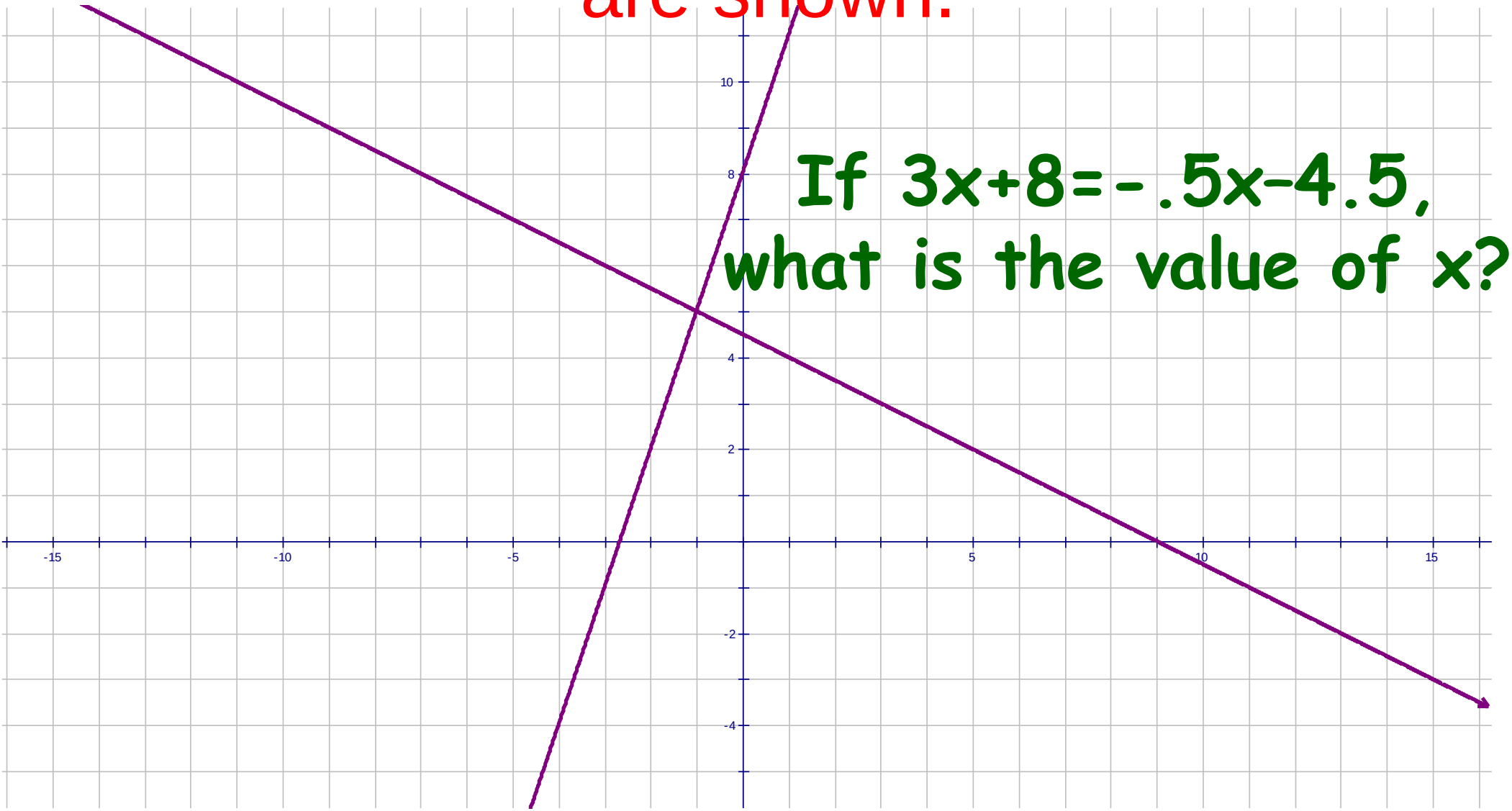
TAKS Objective 4
TEK A.7B
Tutorial
(Grades 9, 10, and 11)

…investigate methods for solving linear equations and inequalities using models, graphs, and properties of equality, select a method, and solve the equations and inequalities.

There are many ways to solve equations other than the traditional algebraic method.

Solving by Graphing

The graphs of y = 3x + 8 and y = -.5x – 4.5 are shown.



If 3x+8=-.5x-4.5, what is the value of x?

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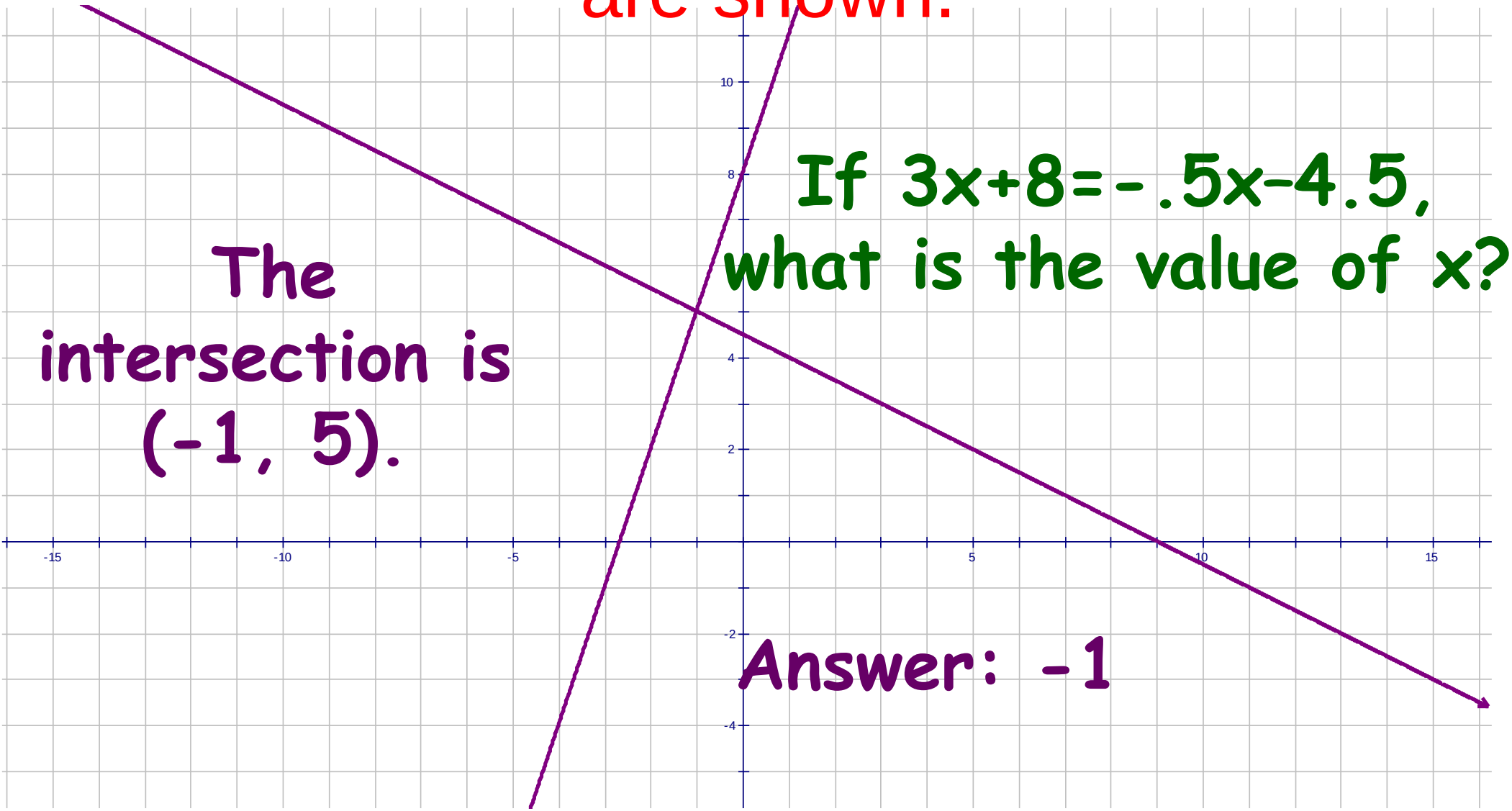


The intersection is (-1, 5).

If 3x+8=-.5x–4.5, what is the value of x?

Answer: -1

Solving when Given One of the Coordinates

When given an equation and one of the coordinates, plug the coordinate in for the appropriate variable and solve for the remaining variable.

Example: If (x, -5.4) is a solution to the equation 5x + 3y = 8, what is the value of x?

Plug -5.4 in for y and then solve for x.

$$5x + 3(-5.4) = 8$$

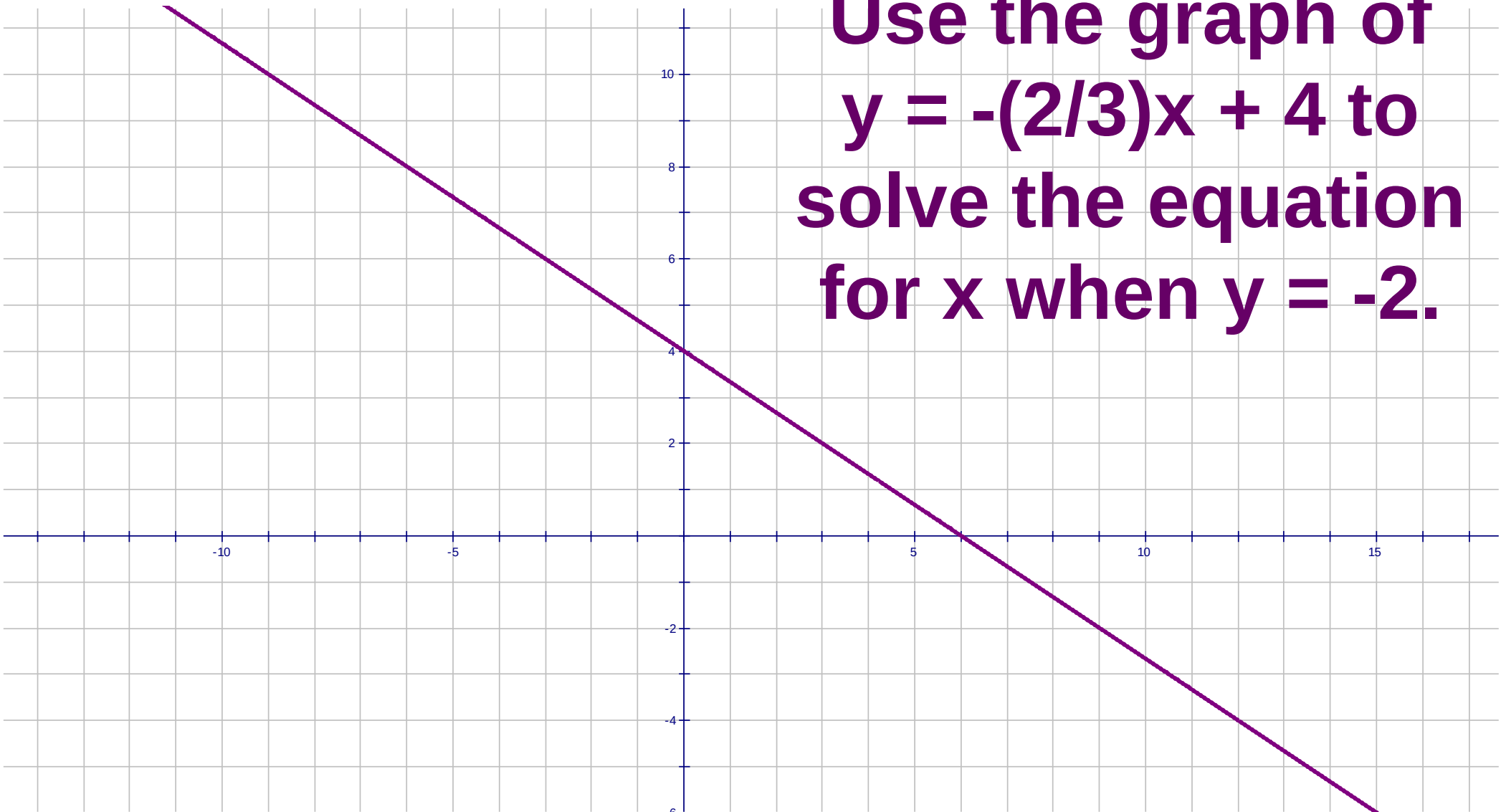
$$5x - 16.2 = 8$$

$$+16.2 \quad +16.2$$

$$\frac{5x}{5} = \frac{24.2}{5}$$

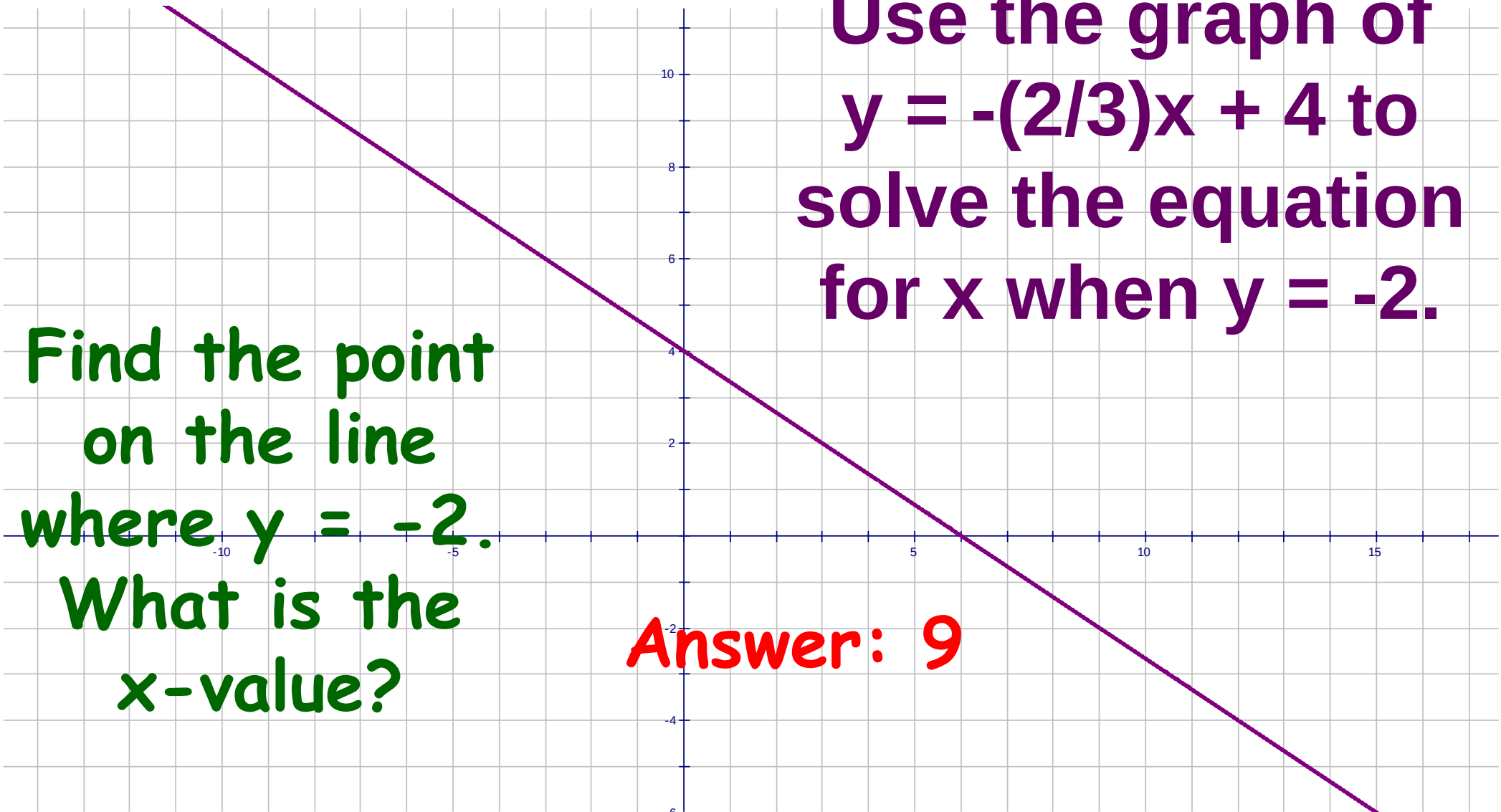
$$x = 4.84$$

Solving when Given an Equation, a Graph, and a Coordinate



Use the graph of y = -(2/3)x + 4 to solve the equation for x when y = -2.

Solving when Given an Equation, a Graph, and a Coordinate



Use the graph of y = -(2/3)x + 4 to solve the equation for x when y = -2.

Find the point on the line where y = -2. What is the x-value?

Answer: 9

Graphing Inequalities

- When graphing > or <, the line is dashed because it is not "equal to".

- When graphing ≤ or ≥, the line is solid because it is "equal to". The solid line shows that the line is shaded.

Graphing Inequalities

- When graphing y > or y ≥ , shade the area where y is getting bigger (usually above the line).

- When graphing y< or y≤, shade the area where y is getting smaller (usually below the line).

Given Equations in Standard Form

$ax + by = c$

- Solve the equation for y.
- First, take “ax” to the other side using the opposite operation of addition or subtraction.
- Next, divide both sides by “b” and simplify.

Solve 3x - 2y = 7 for y.

$$3x - 2y = 7$$

$$-3x \qquad -3x$$

$$\frac{-2y}{-2} = \frac{-3x + 7}{-2}$$

$$y = \frac{3}{2}x - \frac{7}{2}$$

Solve -5x + 4y = -20 for y.

$$-5x + 4y = -20$$

$$+5x \qquad +5x$$

$$\frac{4y}{4} = \frac{5x - 20}{4}$$

$$y = \frac{5}{4}x - 5$$

Given Inequalities in Standard Form

- Solve the inequality for y.

- First, take “ax” to the other side using the opposite operation of addition or subtraction.

- Next, divide both sides by “b” and simplify.

(Reminder: If “b” is negative, flip the inequality.)