Key

Systems of Linear Relations – Practice Test

Foundations & PreCalculus 10 Practice Exam

/37

Name:

Date:

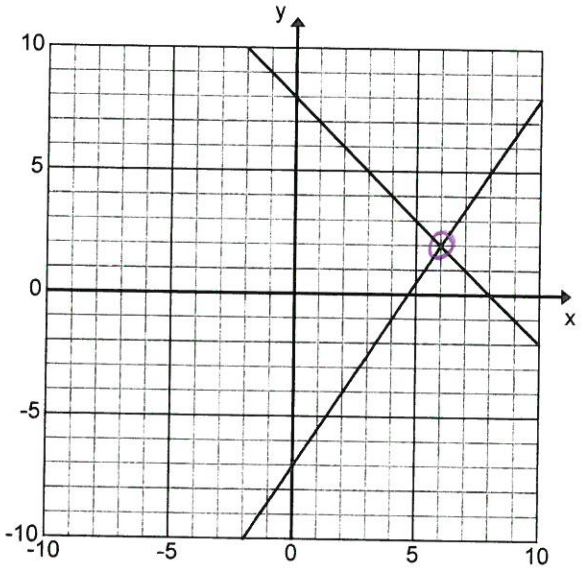
1. Given the following linear system, is the point (2, -2) a solution? Prove it by showing your work. (2 marks)

$2x + 3y = -4$
$x + y = 1$

$2(2) + 3(-2) = -4$
$4 - 6 = -4$
$-2 = -4$ No

$2 - 2 = 1$
$0 = 1$ NO

2. Use the graph of the linear system below to find the solution. (1 mark)

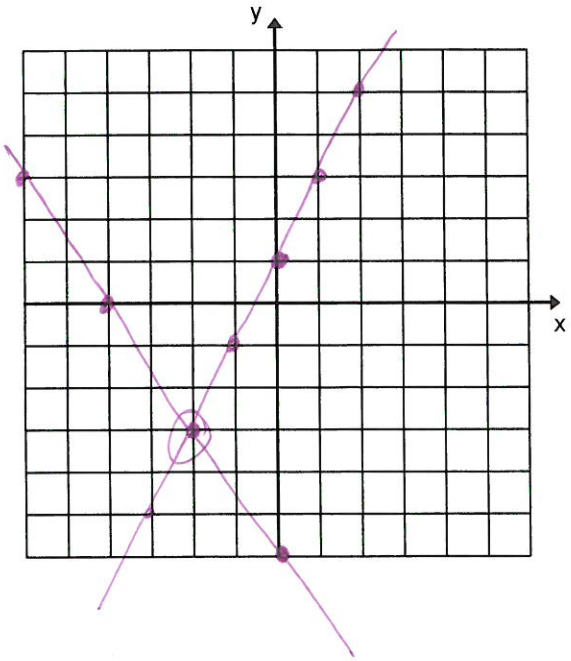


(6, 2)

3. Solve the following linear system using the **graphing method**.
You must show all your work. (6 marks)

$y = -\frac{3}{2}x - 6$

$y = 2x + 1$



$(-2, -3)$

4. Solve the following linear system using the **graphing method**.
You must show all your work. (8 marks)

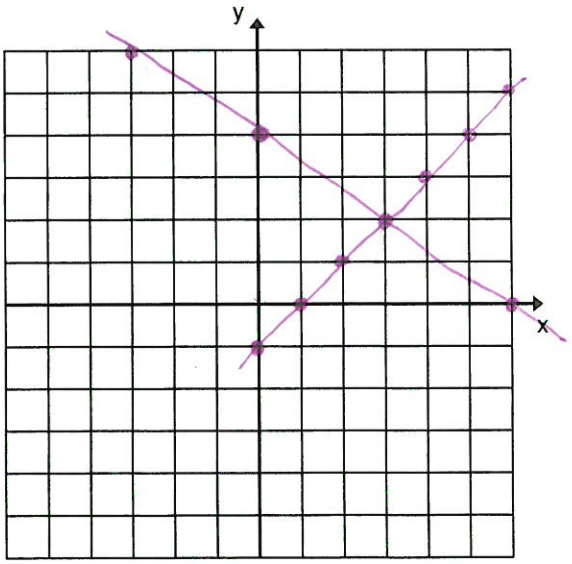
$\frac{2}{3}x + y = 4$ $\quad y = -\frac{2}{3}x + 4$

$2x - 2y = 2$

$-2x \quad -2x$

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

$y = x - 1$



$(3, 2)$

5. Solve the following linear system using the **substitution method**. You must show all your work. (5 marks)

$3x + 4y = -4$
$x + 2y = 2$

$-2y \quad -2y$

$x = -2y + 2$

$3(-2y+2) + 4y = -4$

$-6y + 6 + 4y = -4$

$-2y + 6 = -4$
$\quad -6 \quad -6$

$\frac{-2y}{-2} = \frac{-10}{-2}$

$y = 5$

$x + 2(5) = 2$

$x + 10 = 2$
$\quad -10 \quad -10$

$x = -8$

$(-8, 5)$

Check

$3(-8) + 4(5) = -4$

$-24 + 20 = -4$

$-4 = -4$ ✓

$(-8) + 2(5) = 2$

$-8 + 10 = 2$

$2 = 2$ ✓

6. Solve the following linear system using the **substitution method**. You must show all your work. (5 marks)

$2x - 4y = 7$
$4x + y = 5$

$-4x \quad -4x$

$y = -4x + 5$

$2x - 4(-4x + 5) = 7$

$2x + 16x - 20 = 7$

$18x - 20 = 7$
$\quad +20 \quad +20$

$\frac{18x}{18} = \frac{27}{18}$

$x = \frac{3}{2}$

$\left(\frac{3}{2}, -1\right)$

$2\left(\frac{3}{2}\right) - 4y = 7$

$3 - 4y = 7$
$-3 \quad -3$

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

$y = -1$

Check

$2\left(\frac{3}{2}\right) - 4(-1) = 7$

$3 + 4 = 7$

$7 = 7$ ✓

$4\left(\frac{3}{2}\right) + (-1) = 5$

$6 - 1 = 5$

$5 = 5$ ✓

7. Solve the following linear system using the **elimination method**. You must show all your work. (5 marks)

$-5(3x - 4y = 7)$
$3(5x - 6y = 8)$

$-15x + 20y = -35$
$15x - 18y = 24$

$2y = -11$

$y = \frac{-11}{2}$ or -5.5

$3x - 4(-5.5) = 7$

$3x + 22 = 7$
$-22 \quad -22$

$\frac{3x}{3} = \frac{-15}{3}$

$x = -5$

$(-5, 5.5)$

Check

$3(-5) - 4\left(\frac{-11}{2}\right) = 7$

$-15 + 22 = 7$

$7 = 7$ ✓

$5(-5) - 6\left(\frac{-11}{2}\right) = 8$

$-25 + 33 = 8$
$-33 \quad -33$
$-25 = -25$

8. Solve the following linear system using the **elimination method**. You must show all your work. (5 marks)

$2(2x + 7y = 24)$
$3x = 2y - 4$

$7(3x - 2y = -4)$

$4x + 14y = 48$
$21x - 14y = -28$

$25x = 20$

$x = \frac{20}{25}$

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

$2\left(\frac{4}{5}\right) + 7y = 24$

$5\left(\frac{8}{5} + 7y\right) = (24)5$

$8 + 35y = 120$
$-8 \quad -8$

$\frac{35y}{35} = \frac{112}{35}$

$y = \frac{16}{5}$ or 3.2

$2\left(\frac{4}{5}\right) + 7\left(\frac{16}{5}\right) = 24$

$5\left(\frac{8}{5} + \frac{112}{5}\right) = (24)5$

$8 + 112 = 120$

$120 = 120$ ✓

$3\left(\frac{4}{5}\right) = 2\left(\frac{16}{5}\right) - 4$

$5\left(\frac{12}{5}\right) = \left(\frac{32}{5} - 4\right)5$

$12 = 32 - 20$

$12 = 12$ ✓