

6.2 Part 2

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11:11 AM

6.2 – Solving a system of linear equations by substitution – Part 2

Example 1 : Solve by substitution and check your answer. (Write your solution as an ordered pair)

$$\textcircled{1} \quad \frac{x}{2} - \frac{2y}{3} = 2$$

$$\text{LCM} = 6$$

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

$$\text{LCM} = 4$$

$$\textcircled{1} \quad 3\left(\frac{x}{2}\right) - 2\left(\frac{2y}{3}\right) = 6(2)$$

$$\textcircled{1} \quad 3x - 4y = 12$$

$$\textcircled{2} \quad 4\left(\frac{x}{4}\right) + 4(3y) = 4(-4)$$

$$\textcircled{2} \quad x + 12y = -16$$

$$\textcircled{2} \quad x = -16 - 12y$$

$$\textcircled{1} \quad 3x - 4y = 12$$

$$3(-16 - 12y) - 4y = 12$$

$$-48 - 36y - 4y = 12$$

$$-48 - 40y = 12$$

$$+48$$

$$+48$$

$$\frac{-40y}{-40} = \frac{60}{-40}$$

$$y = \frac{-6}{4}$$

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

- Clear the fractions
Multiply each equation by the LCM of the denominators

- Rewrite an equation as $x =$ or $y =$
Look for $1x$ or $1y$

- Sub into the OTHER equation

- Solve

- Find the value of the other variable

$$x = -16 - 12y$$

$$x = -16 - 12\left(\frac{-3}{2}\right)$$

$$x = -16 + 18$$

$$x = 2$$

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

b) Admission to the concert costs \$5 for students and \$9 for adults. There were 32 people, and \$180 was collected. How many students and how many adults were at the concert? Here is a linear system that represents this situation:

$$a + s = 32$$

$$9a + 5s = 180$$

$a =$ # of adults and $s =$ # of students

$$\textcircled{1} \quad a + s = 32$$

$$\textcircled{2} \quad 9a + 5s = 180$$

$$\textcircled{1} \quad a = \underline{32 - s}$$

$$\textcircled{2} \quad 9(32 - s) + 5s = 180$$

$$288 - 9s + 5s = 180$$

$$288 - 4s = 180$$

$$\begin{array}{r} -4s = -108 \\ \underline{-4} \quad \underline{-4} \end{array}$$

$$s = 27$$

$$a = 32 - s$$

$$a = 32 - 27$$

$$a = 5$$

5 adults and
27 students

Practice: p.425 #4abc, 5bcd, 19ab

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F & PC 10