

Ch 7 Practice Test - Algebra Methods (2024)

Date _____ Period _____

ALL QUESTIONS ARE 10pts. Read instructions! Recommend checking for partial credit.

Solve each system by substitution. Checking recommended - show last step.

1) $y = -9x + 7$
 $-12x - 2y = -2$

① $-12x - 2(-9x + 7) = -2$
 $-12x + 18x - 14 = -2$
 $6x - 14 = -2$
 $+14 \quad +14$

 $6x = 12$
 $\frac{6}{6} \quad \frac{6}{6}$
 $x = 2$

②

FIND Y

$y = -9(2) + 7$
 $y = -11$

③

C: $-11 = -11 \checkmark$
 C: $-2 = -2 \checkmark$

Solve each system by elimination. Checking recommended - show last step.

2) $2x - 5y = 11$ $\rightarrow 2x - 5y = 11$
 $-1(-3x - 5y = -29) \rightarrow 3x + 5y = 29$

 $5x = 40$
 $\frac{5}{5} \quad \frac{5}{5}$
 $x = 8$

FIND Y:

$2(8) - 5y = 11$
 $-16 \quad -16$

 $-5y = -5$
 $\frac{-5}{-5} \quad \frac{-5}{-5}$
 $y = 1$

3) $8x + 10y = 16$
 $-9x - 10y = -3$

 $-x = 13$
 $\frac{-1}{-1} \quad \frac{-1}{-1}$
 $x = -13$

FIND Y:

$8(-13) + 10y = 16$
 $-104 \quad +104$

 $10y = 120$
 $\frac{10}{10} \quad \frac{120}{10}$
 $y = 12$

Solve the system using either the substitution or elimination method.

Checking recommended - show last step.

4) $6x + 3y = 21$

$9y - 6 = x$

$6(9y - 6) + 3y = 21$

$54y - 36 + 3y = 21$

$57y - 36 = 21$
 $+ 36 \quad + 36$

$57y = 57$
 $\frac{57}{57} \quad \frac{57}{57}$

$y = 1$

FIND X:

$x = 9(1) - 6$

$x = 3$

5) $(2x - y = 6) \times -6 \rightarrow -12x + 6y = -36$
 $9x - 6y = 30 \rightarrow 9x - 6y = 30$
 $\underline{-12x + 6y = -36}$
 $\underline{9x - 6y = 30}$
 $\underline{-3x = -6}$
 $\underline{-3 \quad -3}$
 $x = 2$

FIND Y

$9(2) - 6y = 30$

$18 - 6y = 30$
 $\underline{-18 \quad -18}$
 $\underline{-6y = 12}$
 $\underline{-6 \quad -6}$
 $y = -2$

6) $7x + 15y = 12$
 $-3(5x + 5y = 20) \rightarrow -15x - 15y = -60$
 $\underline{7x + 15y = 12}$
 $\underline{-15x - 15y = -60}$
 $\underline{-8x = -48}$
 $\underline{-8 \quad -8}$
 $x = 6$

FIND Y

$5(6) + 5y = 20$
 $\underline{-30 \quad -30}$
 $\underline{5y = -10}$
 $\underline{5 \quad 5}$
 $y = -2$

7) $(3x - 7y = 6) \times 5 \rightarrow 15x - 35y = 30$
 $(-5x + 6y = 7) \times 3 \rightarrow -15x + 18y = 21$
 $\underline{15x - 35y = 30}$
 $\underline{-15x + 18y = 21}$
 $\underline{-17y = 51}$
 $\underline{-17 \quad -15}$
 $y = -3$

FIND X:

$3x - 7(-3) = 6$
 $3x + 21 = 6$
 $\underline{-21 \quad -21}$
 $\underline{3x = -15}$
 $\underline{3 \quad 3}$
 $x = -5$

Solve the system using either the substitution or elimination method.

$$\begin{array}{rcl} 8) \quad 6x + 6y = 12 & \rightarrow & 6x + 6y = 12 \quad | + \\ -2(3x - 9y = -18) & \rightarrow & -6x + 18y = 36 \quad | - \\ \hline & & 24y = 48 \\ & & \underline{24} \quad \underline{24} \\ & & y = 2 \end{array}$$

FIND X:

$$\begin{array}{rcl} 6x + 6(2) & = & 12 \\ 6x + 12 & = & 12 \\ -12 & -12 & \\ \hline 6x & = & 0 \\ \underline{6} & \underline{6} & \\ x & = & 0 \end{array}$$

$$\begin{array}{rcl} 9) \quad -6x - 2y & = & 14 \\ y & = & -3x - 7 \end{array}$$

$$\begin{array}{rcl} -6x - 2(-3x - 7) & = & 14 \\ -6x + 6x + 14 & = & 14 \\ 14 & = & 14 \quad \textcircled{T} \end{array}$$

INFINITE SOLUTIONS

$$\begin{array}{rcl} 10) \quad 10x + 4y = 16 & \rightarrow & 10x + 4y = 16 \\ -2(5x + 2y = 8) & \rightarrow & -10x - 4y = -16 \\ \hline & & 0 = 0 \quad \checkmark \end{array}$$

INFINITE SOLUTIONS

$$\begin{array}{rcl} 11) \quad y & = & 4x + 28 \\ -4x - 6y & = & 28 \end{array}$$

$$-4x - 6(4x + 28) = 28$$

$$-4x - 24x - 168 = 28$$

$$\begin{array}{rcl} -28x - 168 & = & 28 \\ +168 & +168 & \\ \hline \end{array}$$

$$\begin{array}{rcl} -28x & = & 196 \\ -28 & -28 & \\ \hline \end{array}$$

$$x = -7$$

FIND Y:

$$\begin{array}{rcl} y & = & 4(-7) + 28 \\ y & = & 0 \end{array}$$

WPs: Solve the system using either the substitution or elimination method.

- 12) Scott's school is selling tickets to a choral performance. On the first day of ticket sales the school sold 3 senior citizen tickets and 4 child tickets for a total of \$80. The school took in \$104 on the second day by selling 6 senior citizen tickets and 4 child tickets. What is the price each of one senior citizen ticket and one child ticket?

**Key Information:

1ST DAY: 3 senior tix, 4 child tix \rightarrow \$80
2ND DAY 6 senior " , 4 child " \rightarrow \$104

Define variables:

X = Cost of senior ticket (\$'s)

Y = Cost of child ticket (\$'s)

Define system:

EQ1: DAY 1: $3X + 4Y = 80 \rightarrow 3X + 4Y = 80$

EQ2: DAY 2: $(6X + 4Y = 104) \cdot -1 \rightarrow -6X - 4Y = -104$

$$\begin{array}{r} -3X = -24 \\ \hline -3 \quad -3 \end{array}$$

Solve the system:

FIND Y

$$3(8) + 4Y = 80$$

$$\begin{array}{r} 24 \\ + 4Y = 80 \\ \hline -24 \quad -24 \end{array}$$

$$\begin{array}{r} 4Y = 56 \\ \hline 4 \quad 4 \end{array}$$

$$\boxed{Y = 14}$$

$$\boxed{X = 8}$$

Answer (in words):

For the choral performance, senior tickets cost \$8 and child ticket costs \$14

- 13) The county fair is a popular field trip destination. This year the senior class at High School A and the senior class at High School B both planned trips there. The senior class at High School A rented and filled 6 vans and 6 buses with 258 students. High School B rented and filled 12 vans and 14 buses with 586 students. Every van had the same number of students in it as did the buses. Find the number of students in each van and in each bus.

**Key Information:

Hs A: 6 vans, 6 buses, 258 students
Hs B: 12 vans, 14 buses, 586 students

Define variables:

X = # students in a van (units are #)
Y = # students in a bus

Define system:

$$\begin{aligned} \text{EQ1: } 2(6x + 6y) &= 258 \longrightarrow -12x - 12y = -516 \\ \text{EQ2: } 12x + 14y &= 586 \longrightarrow 12x + 14y = 586 \end{aligned}$$

Solve the system:

FIND X

$$6x + 6(35) = 258$$

$$6x + 210 = 258$$

$$\begin{array}{r} 6x + 210 = 258 \\ -210 \quad -210 \\ \hline \end{array}$$

$$\begin{array}{r} 6x = 48 \\ \hline 6 \quad 6 \end{array}$$

$$\boxed{x = 8}$$

$$\frac{12y}{2} = \frac{70}{2}$$

$$\boxed{y = 35}$$

Answer (in words):

The vans hold 8 students and
buses hold 35 students.

