

Warm-up: SAT Workbook: 3.1: 3, 4

Solve each equation for the indicated variable.

1. $2x - y = 5, y$

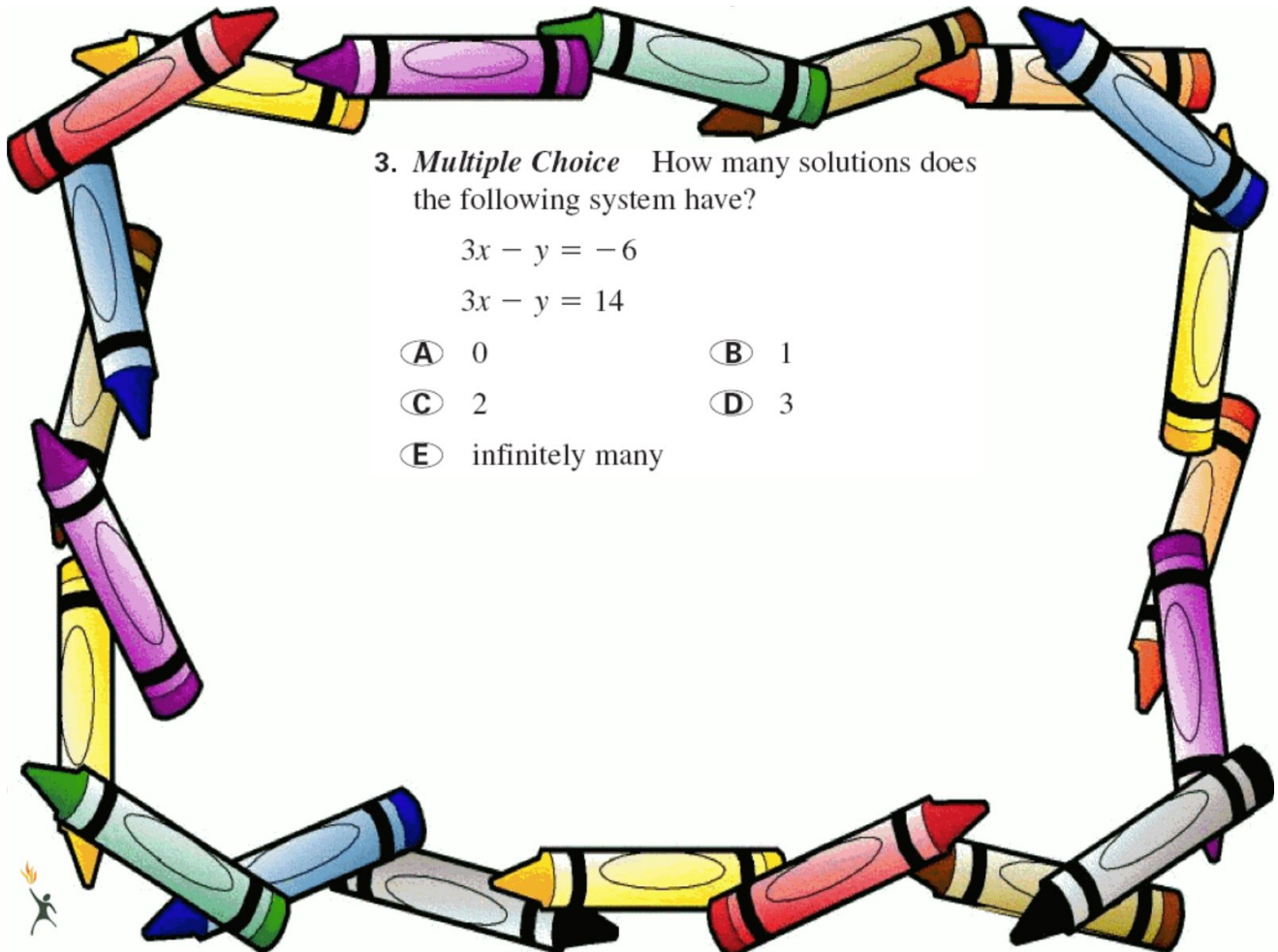
2. $-x + 2y = 3, x$

3. $3x - 4y = 12, y$

4. $3x - 4y = 12, x$

FCAT:

A company's cost and revenue functions for producing and selling x units of a product are $C = 2x + 60$ dollars and $R = 5x$ dollars. The company's break-even point occurs when the cost equals the revenue. What number of units must be produced and sold for the company to break even?

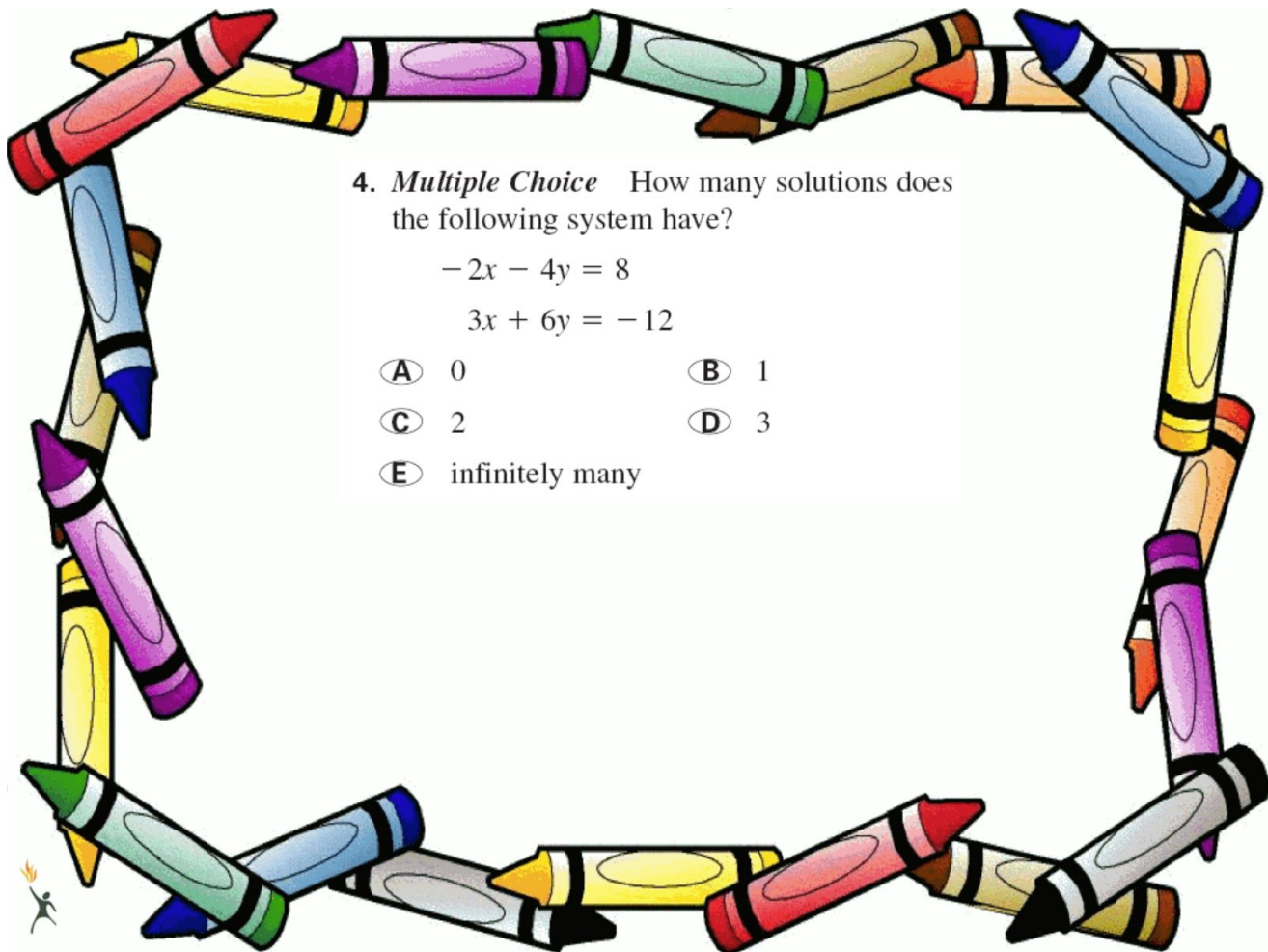


3. *Multiple Choice* How many solutions does the following system have?

$$3x - y = -6$$

$$3x - y = 14$$

- (A) 0 (B) 1
(C) 2 (D) 3
(E) infinitely many



4. **Multiple Choice** How many solutions does the following system have?

$$-2x - 4y = 8$$

$$3x + 6y = -12$$

- (A) 0 (B) 1
 (C) 2 (D) 3
 (E) infinitely many

3.2 Solve Linear Systems Algebraically

3.2 - 1

Substitution method

$$-x + 3y = 1$$

$$4x + 6y = 8$$

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

$$3y - 1 = x$$

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

$$2 - 1 = 1 = x$$

$$4(3y - 1) + 6y = 8$$

$$12y - 4 + 6y = 8$$

$$18y = 12$$

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

KEY CONCEPT

For Your Notebook

The Substitution Method

- STEP 1** Solve one of the equations for one of its variables.
STEP 2 **Substitute** the expression from Step 1 into the other equation and solve for the other variable.
STEP 3 **Substitute** the value from Step 2 into the revised equation from Step 1 and solve.

Linear Combination Method

$$\begin{array}{r} (9x - 5y = -7) \cdot 2 \rightarrow 18x - 10y = -14 \\ (-6x + 4y = 2) \cdot 3 \rightarrow -18x + 12y = 6 \\ \hline 2y = -8 \\ y = -4 \end{array}$$

$$\begin{array}{c} 3.2 - 2 \\ \boxed{(-3, -4)} \end{array}$$

$$\begin{array}{r} -6x + 4(-4) = 2 \\ -6x - 16 = 2 \\ -6x = 18 \\ x = -3 \end{array}$$

KEY CONCEPT

For Your Notebook

The Elimination Method

- STEP 1** Multiply one or both of the equations by a constant to obtain coefficients that differ only in sign for one of the variables.
- STEP 2** Add the revised equations from Step 1. Combining like terms will eliminate one of the variables. Solve for the remaining variable.
- STEP 3** Substitute the value obtained in Step 2 into either of the original equations and solve for the other variable.

Homework: 3.2 pg 174: 3,5,14,17,23,25,35,41,49,61,63

$$\begin{array}{r} 5. \quad 6x - 2y = 5 \\ -3x + y = 7 \\ y = 3x + 7 \end{array}$$

$$\begin{array}{r} 6x - 2(3x + 7) = 5 \\ \cancel{6x} - \cancel{6x} - 14 = 5 \\ -14 = 5 \\ \text{no sol.} \end{array}$$

$$\begin{array}{c} \vdots \\ 5 = 5 \\ \text{inf. sol.} \end{array}$$

61. $p =$ lbs of peanuts
 $c =$ lbs of cashews

$$\begin{aligned} p + c &= 100 \Rightarrow -28p - 28c = -2800 \\ 2.8p + 5.3c &= 330 \Rightarrow \underline{28p + 53c = 3300} \\ &25c = 500 \\ &c = 20 \end{aligned}$$

$$\begin{aligned} p + 20 &= 100 \\ p &= 80 \end{aligned}$$