Name KEY

Date

Solutions to Equations and Systems Final Review

Math 8

1. Determine the number of solutions (one, no, infinitely many) for each.

a) $4x + 3 - 2x = 2x - 3$

$2x + 3 = 2x - 3$

NO Solution

b) $4(x + 2) = 2(x + 6) - 4$

$4x + 8 = 2x + 12 - 4$

$4x + 8 = 2x + 8$

$-8 \quad -8$

$4x = 2x$

$-2x \quad -2x$

$2x = 0$

$x = 0$

one solution

c) $x + 3(x - 1) + 4 = 4x + 1$

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

$4x + 1 = 4x + 1$

Infinite Solutions

2. Find the value of y when $x = 6$ and $\frac{3y + 9}{8} = x$

$8 \cdot \frac{3y + 9}{8} = 6 \cdot 8$

$3y + 9 = 48$

$-9 \quad -9$

$3y = 39$

$\frac{3y}{3} = \frac{39}{3}$

$y = 13$

3. Solve for x.

a) $7(x + 1) = 3(x - 2) - 3$

$7x + 7 = 3x - 6 - 3$

$7x + 7 = 3x - 9$

$-7 \quad -7$

$7x = 3x - 16$

$-3x \quad -3x$

$4x = -16$

$x = -4$

b) $5(x - 1) + 4 = 3(x + 6) + 1$

$5x - 5 + 4 = 3x + 18 + 1$

$5x - 1 = 3x + 19$

$-3x + 1 \quad -3x + 1$

$2x = 20$

$x = 10$

c) $\frac{1}{2}(8x + 12) = 2(x - 1)$

$4x + 6 = 2x - 2$

$-2x - 6 \quad -2x - 6$

$2x = -8$

$\frac{2x}{2} = \frac{-8}{2}$

$x = -4$

4. Solve for x. Determine whether the equation has infinitely many solutions or no solution. Justify you answer.

a) $4(x - 1) = 4(x - 2) - 6$

$4x - 4 = 4x - 8 - 6$

$4x - 4 = 4x - 14$

NO Solution

b) $3(x + 2) = 3(x + 1) + 3$

$3x + 6 = 3x + 3 + 3$

$3x + 6 = 3x + 6$

Inf. Solutions

5. Verizon charges a monthly fee of $8.60 and $0.05 for each text message sent. Sprint charges a monthly fee of $9.80 and $0.03 for each text message sent. How many text messages must be sent for both companies to charge the same amount?

$8.60 + 0.05x = 9.80 + 0.03x$

$-8.60 - 0.03x \quad -8.60 - 0.03x$

$0.02x = 1.20$

$\frac{0.02x}{0.02} = \frac{1.20}{0.02}$

$\boxed{x = 60}$

6. Solve the system of linear equations using the elimination method.

a) $x + y = 16$

$x - y = 4$

$2x = 20$

$\frac{2x}{2} = \frac{20}{2}$

$\boxed{x = 10}$

$x + y = 16$

$10 + y = 16$

$-10 \quad -10$

$\boxed{y = 6}$

b) $3x + 2y = 4$

$2(x - y = 3)$ → $2x - 2y = 6$

$3x + 2y = 4$

$5x = 10$

$\boxed{x = 2}$

$3(2) - 2y = 4$

$6 - 2y = 4$

$-6 \quad -6$

$-2y = -2$

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

$\boxed{y = 1}$

c) $x + y = 30$

$x - y = 10$

$2x = 40$

$\frac{2x}{2} = \frac{40}{2}$

$\boxed{x = 20}$

$20 + y = 30$

$-20 \quad -20$

$\boxed{y = 10}$

d) $x + y = 22$

$x - y = 44$

$2x = 66$

$\frac{2x}{2} = \frac{66}{2}$

$\boxed{x = 33}$

$33 + y = 22$

$-33 \quad -33$

$\boxed{y = -11}$