Mathematics9 Date _____

Unit 8 Solving Equations & Inequalities

8.4 Variable on Both Sides Equations

Ex. In a jar of coins there are 20 more nickels than quarters. The value of the nickels equals the value of the quarters. How many of each coin are in the jar?

Let q = # quarters

$q + 20$ = # of nickles

value of quarters = value of nickels

$0.25q = 0.05(q+20)$

$0.25q = 0.05q + 1$

$-0.05q \quad -0.05q$

$\frac{0.2q}{0.2} = \frac{1}{0.2}$

$q = 5$

5 quarters and 25 nickels

Ex. Solve:

a) $\frac{2}{3}(2x-1) = \frac{1}{2}(3x+1)$

$4(2x-1) = 3(3x+1)$

$8x - 4 = 9x + 3$

$-9x \quad +4 \quad -9x \quad +4$

$\frac{-x}{-1} = \frac{7}{-1}$

$x = -7$

b) $\frac{2b}{3} - \frac{3}{4} = \frac{b}{6} + \frac{1}{2}$

$8b - 9 = 2b + 6$

$-2b + 9 \quad -2b + 9$

$\frac{6b}{6} = \frac{15}{6}$

$b = \frac{5}{2} = 2.5$

c) $\frac{3f+1}{4} = \left(\frac{3+2f}{2}\right)^2$

$3f + 1 = 2(3+2f)$

$3f + 1 = 6 + 4f$

$-3f - 6 \quad -6 \quad -3f$

$-5 = f$

Ex. John has saved $35.50 and is saving an additional $4.25 per week. Jane has saved $24.25 and is saving an additional $5.50 per week. In how many weeks will they have the same amount of money saved?

Let x = # of weeks

John's Savings = Jane's Savings

$35.50 + 4.25x = 24.25 + 5.50x$

$-35.50 \quad -5.50x \quad -35.50 \quad -5.50x$

$\frac{-1.25x}{-1.25} = \frac{-11.25}{-1.25}$

$x =$ 9 weeks

Practice: Textbook pg. 231 #1, 2, 4-6, 12, 14, 17, 19, 23