6.2 Solving Equations Using Balanced Strategies – Notes

Example (1): Solve each equation and verify the answer.

- move variables to the left side of the equals sign.
- move constant terms to the right side of the equals sign.

a) $5a + 7 = 2a + 1$

$-2a \quad -2a$

$3a + 7 = 1$

$-7 \quad -7$

$\frac{3a}{3} = \frac{-6}{3}$

$a = -2$

b) $6x + 2 = 10 + 4x$

$-4x \quad -4x$

$2x + 2 = 10$

$-2 \quad -2$

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

$x = 4$

c) $-3c + 7 = 2c - 8$

$-2c \quad -2c$

$-5c + 7 = -8$

$-7 \quad -7$

$\frac{-5c}{-5} = \frac{-15}{-5}$

$c = 3$

d) $\frac{122}{r} = 3$ $\times r$

$\frac{122}{3} = \frac{3r}{3}$

$r = 40.\overline{6}$

Cross-multiply

$\frac{122}{r} \quad \frac{3}{1}$

$\frac{3r}{3} = \frac{122}{3}$

$r = 40.\overline{6}$

$\left(\frac{3}{5}\right)\left(\frac{-2}{1}\right) = \frac{-6}{5}$

e) $\frac{2a}{3} = \frac{4a}{5} + \frac{7}{1}$ (×5, ×3, ×15)

$\frac{10a}{15} = \frac{12a}{15} + \frac{105}{15}$

$10a = 12a + 105$

$-12a \quad -12a$

$\frac{-2a}{-2} = \frac{105}{-2}$

$a = 52.5$

f) $\frac{3}{5}(m-2) = \frac{2}{3}(m-\frac{1}{2})$

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

-2

6

-1

3

$\frac{3}{5}m - \frac{6}{5} = \frac{2}{3}m - \frac{1}{3}$ (×3, ×3, ×5, ×5)

$\frac{9}{15}m - \frac{18}{15} = \frac{10}{15}m - \frac{5}{15}$

$9m - 18 = 10m - 5$

$-10m \quad -10m$

$-1m - 18 = -5$

$+18 \quad +18$

$\frac{-1m}{-1} = \frac{13}{-1}$

$m = -13$

Example (2): A cell phone company offers two plans.

Plan A: 120 fee minutes, $0.75 per additional minute
Plan B: 30 free minutes, $0.25 per additional minute

Which time for call will result in the same cost for both plans?

$=$

x = # of minutes

Plan A = Plan B

$0.75(x-120) = 0.25(x-30)$

$0.75x - 90 = 0.25x - 7.5$

$-0.25x \quad -0.25x$

$0.5x - 90 = -7.5$

$+90 \quad +90$

$\frac{0.5x}{0.5} = \frac{82.5}{0.5}$

$x = 165$

@ move variable to the left.

The plans cost the same amount when you use 165 min