Core Focus: Tougher Equations

Pages 74–75

1. $\frac{1}{3}x = -12;\ \frac{\cancel{3}}{1} \cdot \frac{1}{\cancel{3}}x = \frac{3}{1} \cdot (-12);\ x = -36$

2. $-\frac{3}{4}x = 21;\ -\frac{\cancel{4}}{\cancel{3}} \cdot \left(-\frac{\cancel{3}}{\cancel{4}}x\right) = -\frac{4}{\cancel{3}} \cdot \overset{7}{\cancel{21}};\ x = -28$

3. $\frac{2}{5}x - 8 = 14;\ \frac{2}{5}x - 8 + 8 = 14 + 8;\ \frac{2}{5}x = 22;$

$\frac{\cancel{5}}{\cancel{2}} \cdot \frac{\cancel{2}}{\cancel{5}}x = \frac{5}{\cancel{2}} \cdot \overset{11}{\cancel{22}};\ x = 55$

4. $0.8x - 9 = 0.4;\ 0.8x - 9 + 9 = 0.4 + 9;\ 0.8x = 9.4;$

$\frac{0.8x}{0.8} = \frac{9.4}{0.8};\ x = 11.75$

5. $\frac{1}{6}(18x + 24) = -14;\ \frac{1}{\cancel{6}} \cdot \overset{3}{\cancel{18}}x + \frac{1}{\cancel{6}} \cdot \overset{4}{\cancel{24}} = -14;$

$3x + 4 = -14;\ 3x + 4 - 4 = -14 - 4;\ 3x = -18;$

$\frac{3x}{3} = \frac{-18}{3};\ x = -6$

6. $1.8(3x - 1) = 17.64;\ 1.8 \cdot 3x - 1.8 \cdot 1 = 17.64;$
$5.4x - 1.8 = 17.64;\ 5.4x - 1.8 + 1.8 = 17.64 + 1.8;$

$5.4x = 19.44;\ \frac{5.4x}{5.4} = \frac{19.44}{5.4};\ x = 3.6$

7. $4.8x - 12 = 3.4x - 5;$
$4.8x - 3.4x - 12 = 3.4x - 3.4x - 5;$
$1.4x - 12 = -5;$
$1.4x - 12 + 12 = -5 + 12;$

$1.4x = 7;\ \frac{1.4x}{1.4} = \frac{7}{1.4};\ x = 5$

8. $\frac{5}{9}x - 4 = \frac{1}{3}(x - 6);\ \frac{5}{9}x - 4 = \frac{1}{3}x - \frac{1}{3} \cdot 6;$

$\frac{5}{9}x - 4 = \frac{1}{3}x - \frac{\cancel{2}}{\cancel{3}} \cdot \overset{2}{\cancel{6}};\ \frac{5}{9}x - 4 = \frac{1}{3}x - 2;$

$\frac{5}{9}x - \frac{1}{3}x - 4 = \frac{1}{3}x - \frac{1}{3}x - 2;\ \frac{5}{9}x - \frac{1}{3}x - 4 = -2;$

$\frac{5}{9}x - \frac{3}{9}x - 4 = -2;\ \frac{2}{9}x - 4 = -2;$

$\frac{2}{9}x - 4 + 4 = -2 + 4;\ \frac{2}{9}x = 2;\ \frac{\cancel{9}}{\cancel{2}} \cdot \frac{\cancel{2}}{\cancel{9}}x = \frac{9}{\cancel{2}} \cdot \overset{1}{\cancel{2}};\ x = 9$

9. No, Angela did not solve the equation correctly. She applied the distributive property incorrectly.

$\frac{3}{8}(8x - 24) = 18;\ \frac{3}{8} \cdot 8x - \frac{3}{8} \cdot 24 = 18;$

$\frac{3}{\cancel{8}} \cdot \overset{1}{\cancel{8}}x - \frac{3}{\cancel{8}} \cdot \overset{3}{\cancel{24}} = 18;\ 3x - 9 = 18;$

$3x - 9 + 9 = 18 + 9;\ 3x = 27;\ \frac{3x}{3} = \frac{27}{3};\ x = 9$