6.2 Notes: Solving Linear Equations and Proportions

Solution Set → {3}

Steps Pg 319

1-7 Solving Linear Equations

1) $14(3x-2)+10=12(2x-1)+48$

$42x-28+10=24x-12+48$

$42x-18=24x+36$

$-24x \quad +18$

$\frac{18x}{18}=\frac{54}{18}$

$\boxed{x=3}$ {3}

2) $3(2x-5)-7(x-2)=4(2x-3)+2$

$6x-15-7x+14=8x-12+2$

$-x-1=8x-10$

$+x \quad +10 \quad +x \quad +10$

$\frac{9}{9}=\frac{9x}{9}$

$\boxed{1=x}$ {1}

3) $9x+7=3(3x+1)$

$9x+7=9x+3$

$-9x \quad -3 \quad -9x \quad -3$

$4 \neq 0$

No Solution

4) $7x+9=9(x+1)-2x$

$7x+9=9x+9-2x$

$7x+9=7x+9$

Infinite Solutions

5) $\left(\frac{2x}{3}\right)^6=\left(7-\frac{x}{2}\right)^6$

$4x=42-3x$

$\frac{7x}{7}=\frac{42}{7}$

$\boxed{x=6}$

$\frac{2(6)}{3}=7-\frac{6}{2}$

$4=7-3$ ✓

6) $\left(\frac{1}{8}(15-3x)\right)^8=\left(x+\frac{1}{2}\right)^8$

$15-3x=8x+4$

$-4 \quad +3x \quad +3x \quad -4$

$\frac{11}{11}=\frac{11x}{11}$

$\boxed{1=x}$

$\frac{1}{8}(15-3)=1+\frac{1}{2}$

$\frac{1}{8}(12)=\frac{3}{2}=\frac{3}{2}$

$\frac{12}{8}\div\frac{4}{4}$

7) $\left(\frac{3x}{5}-x\right)^{10}=\left(\frac{x}{10}-\frac{5}{2}\right)^{10}$

$6x-10x=x-25$

$-4x=x-25$

$-x \quad -x$

$\frac{-5x}{-5}=\frac{-25}{-5}$

$\boxed{x=5}$

8-11 Solving Proportions

8) $\frac{22}{60-x}=\frac{2}{x}$

$22x = 120 - 2x$

$+2x \quad +2x$

$\frac{24x}{24} = \frac{120}{24} \div 6$

$x = \frac{20}{4} = \boxed{5}$

9) $\frac{x+10}{10}=\frac{x-2}{4}$

$4(x+10) = 10(x-2)$

$4x + 40 = 10x - 20$

$\frac{60}{6} = \frac{6x}{6}$

$\boxed{10 = x}$

10) The length of a man's forearm is in proportion to the length of his hand. The length of a John's hand is 8 inches and the length of his forearm is 12 inches. What is the length of Tom's hand if his forearm has a length of 15 inches?

$4 \div \frac{8}{12} = \frac{x}{15}$

$4 \div \frac{2}{3} = \frac{x}{15}$

$\frac{30}{3} = \frac{3x}{3}$

$\boxed{10 = x}$ 10 inches

11) The amount of commission a realtor earns is proportional to the price of the house she/he sells. Jane earned $5700 on a house that sold for $95,000. How much did a house sell for, if Jane made $10,000 in commission?

$\frac{5700}{95000} = \frac{10\,000}{x}$

$\frac{57}{950} = \frac{10,000}{x}$

$\frac{57x}{57} = \frac{950(10,000)}{57}$

$x = \$166,667$

$\frac{5700}{95,000} \stackrel{?}{=} \frac{10,000}{166,667}$

$.06 = .06$ ✓