

4.1 Equations with variables on both sides

$$5x - 8 = 3x + 12$$

$$\begin{array}{r} -3x \quad -3x \\ \hline 2x - 8 = 12 \\ \quad +8 \quad +8 \\ \hline 2x = 20 \\ \quad \underline{\quad} \quad \underline{\quad} \\ x = 10 \end{array}$$


$$\begin{array}{l} 5(10) - 8 = 3(10) + 12 \\ 50 - 8 = 30 + 12 \\ 42 = 42 \end{array}$$

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ex 5 pg 87  $J = \text{Jack's age}$

$$20 + 4J = 6J$$

$$\begin{array}{r} -4J \quad -4J \\ \hline 20 = 2J \\ \quad \underline{\quad} \quad \underline{\quad} \\ 10 = J \end{array}$$

$$\begin{array}{l} 20 + 4(10) = 6(10) \\ 20 + 40 = 60 \\ 60 = 60 \end{array}$$


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4.2 Equations with parentheses

$$6x - 3(4 - 5x) = 30$$

$$6x - 12 + 15x = 30 \quad \text{distribute}$$

$$\begin{array}{r} 21x - 12 = 30 \quad +12 \\ 21x = 42 \quad \div 2 \\ x = 2 \end{array}$$

do the check!

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4.3 Number problems

Ex 1:  $l = \text{larger \#}$   
 $s = \text{smaller \#}$

$$l = 7s - 6$$

smaller # = 5  
larger # =  $7s - 6$

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Ex 2  $f, s, t$

$$s = 4f$$

$$t = 1 + s \Rightarrow 1 + 4f$$

first # =  $f$   
second # =  $4f$   
third # =  $1 + 4f$

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Ex 3  $J = \text{Julie's salary}$   
 $L = \text{Li's salary}$

$$J = 3L$$

$$J + L = 320 \quad \text{too many vars (2)}$$

$$3L + L = 320$$

$$4L = 320 \div 4$$

$$L = 80$$

$$J = 3(80) = 240$$

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$l = \text{longer piece}$   
 $s = \text{shorter piece}$

$$30 = l + s$$

$$l = 8 + s$$

longer is 8 more than shorter  
 $l = 8 + s$

$$30 = l + s$$

$$30 = (8 + s) + s$$

$$30 = 8 + 2s$$

$$22 = 2s$$

$$11 = s \therefore l = 8 + 11 \Rightarrow l = 19$$

11, 19  
 $30 = 11 + 19$   
 $30 = 30 \checkmark$   
 $19 = 8 + 11$   
 $19 = 19 \checkmark$

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4.4 Equations with fractions

$$\frac{2}{3}x = \frac{5}{6}$$

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

$$x = \frac{15}{12} \div 3$$

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

$\frac{2 \cdot 5}{2 \cdot (2 \cdot 3)}$   
 $\frac{5 \cdot 6}{4 \cdot 3}$

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$$\left( \frac{2}{3}x = \frac{5}{6} \right) \cdot 6$$

$$\frac{3}{6} \quad \frac{6}{6}$$

$$4x = 5$$

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

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$$\frac{3}{2}x - 1 = \frac{4}{5}x + 6$$

$$-\frac{4}{5}x \quad -\frac{4}{5}x$$

$$\frac{3}{2}x - \frac{4}{5}x - 1 = 6$$

$$+\frac{1}{1} \quad +1$$

$$\frac{3}{2}x - \frac{4}{5}x = 7$$

$$\frac{7}{10}x = 7$$

$$\frac{10}{7} \left( \frac{7}{10}x \right) = \frac{10}{7} \cdot 7$$

$$x = 10$$

$\frac{3}{2} - \frac{4}{5} \quad \frac{15}{10} - \frac{8}{10} \quad \frac{7}{10}$   
 $\frac{5}{10} \quad \frac{2}{10}$   
 $\frac{10}{20} \quad \frac{4}{10}$   
 $\frac{10}{20}$

$\frac{30}{2} - 1 = \frac{40}{5} + 6$   
 $15 - 1 = 8 + 6$   
 $14 = 14$  😊

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

$$+\frac{1}{2}x \quad +\frac{1}{2}x$$

$$\frac{2}{6}x - 5 = 4$$

$$+\frac{5}{5} \quad +5$$

$$\frac{2}{6}x = 9$$

$$x = \frac{54}{2}$$

$\frac{2}{3} + \frac{1}{2} \quad \frac{4}{6} + \frac{3}{6} \quad \frac{7}{6}$   
 $\frac{2}{2} \cdot \frac{2}{3} + \frac{2}{2} \cdot \frac{1}{2}$   
 $\frac{4}{6} + \frac{3}{6}$   
 $\frac{7}{6}$   
 $\frac{2}{3} \left( \frac{54}{7} \right) - 5 = 4 - \frac{1}{2} \left( \frac{54}{7} \right)$   
 $\frac{36}{7} - \frac{35}{7} = \frac{28}{7} - \frac{27}{7}$   
 $\frac{1}{7} = \frac{1}{7}$  😊

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4.5 Equations with decimals

Ex 5 p 102

$$0.9x + 19.2 = 0.06(8 - 0.6x) + 0.468x$$

$$0.9x + 19.2 = .48 - .036x + 0.468x$$

$$0.9x + 19.2 = .48 + .432x$$

$$-.432x \quad -.432x$$

$$-.468x + 19.2 = .48$$

$$.468x = .48 - 19.2$$

$$x = -40 \quad \text{then check!!}$$

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*scrap*

$$\begin{array}{r} 0.06 \\ 8 \\ \hline .48 \end{array} \quad \begin{array}{r} .06 \\ .6 \\ \hline .036 \end{array}$$

$$\begin{array}{r} .468 \\ -.036 \\ \hline .432 \end{array} \quad \begin{array}{r} .400 \\ -.432 \\ \hline .468 \end{array}$$

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4.6 Percent problems

42 is what % of 75

$$42 = x \cdot 75$$

$\Rightarrow 75 \left( \frac{42}{75} = x \right)$

$$.56 = x \Rightarrow 56\%$$

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percent  
per cent  
of 100

$$\left[ \frac{42}{75} = \frac{x}{100} \right] 100$$

$$\frac{42}{75} \cdot 100 = x$$

$$(.56)100 = x \Rightarrow 56\%$$

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93% of 200 is ?

$$.93 \cdot 200 = x$$

$$186 = x$$


.5%  
50% =  $\frac{1}{2} = .50$

.005    .01  
10    2

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4.7 Perimeter problems

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$$\begin{array}{l} a = 3 + b \\ c = 2b - 4 \\ a + b + c = 31 \\ (3 + b) + b + (2b - 4) = 31 \\ -1 + 4b = 31 \\ 4b = 32 \\ b = 8 \end{array}$$

$$\begin{array}{l} b = 8 \\ a = 3 + 8 = 11 \\ c = 2(8) - 4 = 12 \end{array}$$

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Chapter 4 homework  
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2,4,5,8,9,12,15,19,25

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