

CHAPTER 4 REVIEW

4.1 – SOLVE SIMPLE EQUATIONS

1. Solve each equation using *one-step* opposite operations

(a) $x + 4 = 7$
 $x = 7 - 4$
 $x = 3$

(b) $x - 3 = 10$

(c) $-3 + x = 15$

(d) $\frac{4x}{4} = \frac{20}{4}$

(e) $5x = 40$

(f) $-7x = 28$

$x = 5$

(g) $\frac{x}{3} = 2$

(h) $\frac{x}{5} = -7$

(i) $\frac{x}{-8} = -3$

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

$x = 6$

2. Solve each equation using *two-step* opposite operations

(a) $5x + 3 = 13$
 $5x = 13 - 3$
 $\frac{5x}{5} = \frac{10}{5}$

(b) $7x - 3 = 11$

(c) $-2x + 3 = -5$

$x = 2$



3. Solve the following equations using opposite operations and check your solution

EQUATION	CHECK YOUR SOLUTION
(a) $x - 4 = 3$ $x = 3 + 4$ $x = 7$	$LS = x - 4$ $RS = 3$ $= 7 - 4$ $= 3$ $= RS$
(b) $x + 5 = -11$	
(c) $4x = 44$	
(d) $\frac{x}{4} = -3$	
(e) $5x + 7 = 42$ $5x = 42 - 7$ $\frac{5x}{5} = \frac{35}{5}$ $x = 7$	$LS = 5x + 7$ $RS = 42$ $= 5(7) + 7$ $= 42$ $= RS$
(f) $-3x - 8 = 7$	

4. A retail store sells DVDs for **\$20 each**. Tyrone purchased **\$260** worth of DVDs.

(a) Using **d** to represent the **number of DVDs** purchased, write an equation to model this scenario

(b) Solve the equation

4.2 – SOLVE MULTI-STEP EQUATIONS

1. Solve each equation

(a) $5 + 3x + 4x = 19$
 $7x = 19 - 5$
 $\frac{7x}{7} = \frac{14}{7}$
 $x = 2$

(b) $15x - 6 - 10x = 9$

(c) $5x + 3 - 9x + 13 = 0$

(d) $32 = 5 - 4x - 5x$

2. Solve each equation

(a) $6x + 8 = 4x + 18$
 $6x - 4x = 18 - 8$
 $\frac{2x}{2} = \frac{10}{2}$
 $x = 5$

(b) $-8x - 5 = 2x + 15$

(c) $3x - 6 = -x - 2$

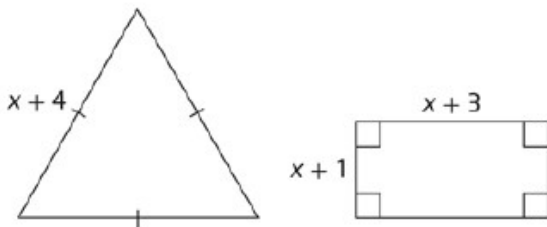
(d) $7x + 8 = 3x - 12$



3. Solve each equation and check your solution

EQUATIONS	CHECK YOUR SOLUTION	
(a) $5(x + 4) = 3x + 14$ $5x + 20 = 3x + 14$ $5x - 3x = 14 - 20$ $\frac{2x}{2} = \frac{-6}{2}$ $x = -3$	$LS = 5(x + 4)$ $= 5(-3 + 4)$ $= 5(1)$ $= 5$ $= RS$	$RS = 3x + 14$ $= 3(-3) + 14$ $= 5$ $= LS$
(b) $2(x - 3) = 5x - 6$		
(c) $5(x + 4) + 2(x + 5) = 51$		

4. An equilateral triangle and a rectangle have the same perimeter. Determine the **side lengths** of both shapes



4.3 – SOLVE EQUATIONS INVOLVING FRACTIONS

1. Solve each equation

(a) $\frac{x-3}{4} = 2$

$$4\left(\frac{x-3}{4}\right) = 4(2)$$

$$x-3 = 8$$

$$x = 8 + 3$$

$$x = 11$$

(b) $\frac{x+7}{5} = -3$

(c) $6 = -\frac{3(x-7)}{5}$

(d) $\frac{3(x+4)}{2} = 9$

(e) $1 = \frac{2x-3}{5}$

(f) $\frac{3+x}{-2} = 4$

(g) $\frac{4(x+2)}{5} = 3$

2. Solve each equation

(a) $\frac{x-4}{5} = \frac{x-3}{6}$

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

$$6x - 24 = 5x - 15$$

$$6x - 5x = -15 + 24$$

$$x = 9$$

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

(c) $\frac{x+4}{3} = \frac{x+2}{5}$

$$(d) \quad \frac{2(x-5)}{3} = \frac{4(x+2)}{5}$$

$$(e) \quad \frac{2(3x+2)}{5} = \frac{3(x+5)}{4}$$

4.4 – MODELLING WITH FORMULAS

1. Rearrange each formula to isolate the variable indicated

$$(a) \quad \frac{C}{\pi} = \frac{\pi d}{\pi}, \text{ for } \mathbf{d}$$
$$\frac{C}{\pi} = d$$

$$(b) \quad d = vt, \text{ for } \mathbf{t}$$

$$(c) \quad A = P + I, \text{ for } \mathbf{I}$$

$$(d) \quad y = mx + b, \text{ for } \mathbf{m}$$
$$\frac{y-b}{x} = \frac{mx}{x}$$
$$\frac{y-b}{x} = m$$

$$(e) \quad Ax + By + C = 0, \text{ for } \mathbf{y}$$

$$(f) \quad F = ma, \text{ for } \mathbf{a}$$

$$(g) \quad V = IR, \text{ for } \mathbf{R}$$

$$(h) \quad P = 2L + 2W, \text{ for } \mathbf{L}$$

$$(i) \quad A = \frac{bh}{2}, \text{ for } \mathbf{h}$$

2. Rearrange the formula for the variable indicated

(a) $\frac{P}{R} = \frac{I^2 R}{R}$, for **I** (b) $V = \pi r^2 h$, for **r** (c) $c^2 = a^2 + b^2$, for **b**

$$\frac{P}{R} = I^2$$

$$\sqrt{\frac{P}{R}} = \sqrt{I^2}$$

$$\sqrt{\frac{P}{R}} = I$$

3. The surface area, **SA**, of a cube is related to the length of the side of the cube, **s**, by the formula **SA = 6s²**

(a) Rearrange this formula to isolate **s**

(b) Calculate the length of side **s** if **surface area is 800 cm²**

4.5 – MODELLING WITH ALGEBRA

1. Write an algebraic expression to represent each description. Let **x** represent the unknown number

(a) Quadruple a number = **4x** (b) Three more than a number = _____

(c) One third a number = _____ (d) Four less than triple a number = _____

(e) Five times a number = _____ (f) Two less than a number = _____

(g) Six more than twice a number = _____



2. Write an equation to represent each sentence and solve each equation. Use x to represent the unknown number/value

(a) Five times a number equals 85 $5x = 85$

$$\frac{5x}{5} = \frac{85}{5}$$
$$x = 17$$

(b) An area increased by 8 is 117 _____

(c) Three more than double a number equals 33 _____

3. (a) The sum of three consecutive integers is **168**. What are the three integers?

	<i>ALGEBRAIC EXPRESSION</i>	<i>NUMBER / CHECK</i>
1 st integer	x	
2 nd integer		
3 rd integer		
Sum		

- (b) The sum of three consecutive integers is **120**. What are the three integers?

	<i>ALGEBRAIC EXPRESSION</i>	<i>NUMBER / CHECK</i>
1 st integer	x	
2 nd integer		
3 rd integer		
Sum		

4. Two friends are collecting vintage vinyl records. Natasha has **250 more** records than Kristen. Together, they have collected **880 records**. How many records did each person collect?

	<i>ALGEBRAIC EXPRESSION</i>	<i>NUMBER / CHECK</i>
Natasha		
Kristen		
Sum		

5. Jack is **4 years older** than his sister Naomi. The sum of their ages is **30**. How old are Jack and Naomi?

	<i>ALGEBRAIC EXPRESSION</i>	<i>NUMBER / CHECK</i>
Jack		
Naomi		
Sum		

6. Ashley works part-time at a clothing store. She is paid **\$8.50 per hour** plus a **\$2** commission for each clothing item she sells.

- (a) Using **T** to represent her total pay, **h** to represent the number of hours and **c** to represent each item of clothing she sells, write an **algebraic expression** which represents this scenario

- (b) Calculate the **total pay** Ashley earns if she works for **12 hours** and sells **30 items of clothing**

- (c) Calculate how many **clothing items** Ashley needs to sell to earn **\$475** and working **10 hours**

- (d) **How many hours** does Ashley need to work if she sells **40 items of clothing** and earns **\$250**?



SOLUTIONS

4.1

1. (b) 13 (c) 18 (e) 8 (f) -4 (h) -35
(i) 24
2. (b) 2 (c) 4
3. (b) -16 (c) 11 (d) -12 (f) -5
4. (a) $20d = 260$ (b) 13

4.2

1. (b) 3 (c) 4 (d) -3
2. (b) -2 (c) 1 (d) -5
3. (b) 0 (c) 3
4. $x = 4$, Triangle = 8 each side, Rectangle - width = 5, length = 7

4.3

1. (b) -22 (c) -3 (e) 4 (f) -11 (g) $7/4$
2. (b) -10 (c) -7 (d) -37 (e) $59/9$

4.4

1. (b) $t = \frac{d}{v}$ (c) $I = A - P$ (e) $y = \frac{-Ax - C}{B}$
- (f) $a = \frac{F}{m}$ (g) $R = \frac{V}{I}$ (h) $L = \frac{P - 2W}{2}$
- (i) $h = \frac{2A}{b}$

2. (b) $r = \sqrt{\frac{V}{\pi h}}$ (c) $b = \sqrt{c^2 - a^2}$

3. (a) $s = \sqrt{\frac{SA}{6}}$ (b) 11.54 cm

4.5

1. (b) $x + 3$ (c) $\frac{1}{3}x$ (d) $3x - 4$ (e) $5x$
(f) $x - 2$ (g) $2x + 6$

2. (b) $x + 8 = 117, x = 109$ (c) $2x + 3 = 33, x = 15$

3. (a) Three numbers = 55, 56, 57 (b) Three numbers = 39, 40, 41

4. Kristen = 315, Natasha = 565

5. Naomi = 13, Jack = 17

6. (a) $T = 8.50h + 2c$ (b) \$162 (c) 195 (d) 20