

Chapter 3.1 – Application to Equation

Quality – Accuracy – Transfer – 100%

Section 1. The Language of Arithmetic.

<i>Addition</i> (The Sum of)	<i>Subtraction</i> (The difference of)	<i>Multiplication</i> (The Product of)	<i>Division</i> (The Quotient of)
Plus more Increase and Total Combine	decrease Take Away Less diminish minus Subtract decline distance Change	Times Cube by Multiply of (to, from, etc) Twice 2(Square	divide Ratios Over $\frac{1}{2}$
<i>Equality</i>	<i>Inequality</i>	<i>Pre-Existing Conditions</i> P&C	
Same equals result is was, will be are Together	$<$ \neq $>$ \neq \leq \neq \geq \neq	from 7 less $X = 7 - X$ than 7 less than $X = X - 7$ to Subtract 8 from 10 exceeds by 10 - 8 X added to 20 $20 + X$	

Section 2. Writing the Algebraic Phrase from the Verbal.

- | | |
|--|---------------------------------|
| 1. The distance d , decreased by 12. | 1. <u>$d - 12$</u> |
| 2. Eight less than twice the area, a . | 2. <u>$2a - 8$</u> |
| 3. Four pounds more than 5 times the weight, w . | 3. <u>$5w + 4$</u> |
| 4. Twice the sum of the height h and 3 feet. | 4. <u>$2(h + 3)$</u> |
| 5. Two less than 5 times a number x . | 5. <u>$5x - 2$</u> |
| 6. Five times a number, decreased by 2. | 6. <u>$5x - 2$</u> |
| 7. The difference between 5 times a number x and 2. | 7. <u>$(5x - 2)$</u> |

8. Expressing Totals Using Percents of Numbers – Sales Tax and Total Cost.

- a. Express the total cost of a couch that costs c , increased by an 8% sales tax.

$$100\% = 1$$

$$1c + .08c$$

$$= 1.08c$$

Section 3. Expressing Relationships between Two Related Quantities.

9. Express the relationships using the variable x :

- a. Two numbers differ by 12.

$$\underline{x \quad (x+12)}$$

- b. Mike's age now, and Mike's age in 8 years.

$$\underline{x \quad (x+8)}$$

- c. One number is 6 less than the other.

$$\underline{x \quad (x-6)}$$

- d. One number is 12% less than the other.

$$\underline{x \quad .88x}$$

10. A Classic – The “Separate” Problem.

- a. The sum of two numbers is 20.

$$\underline{x \quad (20-x)}$$

- b. A 25-foot length of board is cut into two pieces.

$$\underline{x \quad (25-x)}$$

11. More Practice:

- a. The Bisons scored 24 points more than the Chicklets.

$$\underline{x \quad (x+24)}$$

- b. Sheila was walking 1.4 times faster than Jim.

$$\underline{x \quad 1.4x}$$

- c. Bill and Mary share \$75

$$\underline{x \quad (75-x)}$$

- d. Kim has 7 more than 5 times the amount that Mary has.

$$\underline{x \quad (5x+7)}$$

- e. The length of the rectangle is 3 feet less than 4 times the width.

$$\boxed{4x-3} \quad x$$

- f. A Delphi Corp., the number of employees increased 12% in 2004 from 2003.

$$\underline{\begin{matrix} x & 1.12x \\ 2003 & 2004 \end{matrix}}$$

Value (#)

1. A Total Cost Problem:

The costs for seeing a movie varies for adults and children. The cost for an adult is \$6.50 and for the children it is \$4.25. Write an expression to cover the total cost for the movie for x adults and y children.

$$6.50x + 4.25y$$

2. Represent the total value for x nickels and $(2x + 5)$ dimes.

$$5x + 10(2x + 5)$$

Section 4. Consecutive Integers – Writing Let Statements for Problem Solving.

- a. Write for 3 consecutive integers:

$$\begin{array}{ccc} 7 & 8 & 9 \\ \hline x & (x+1) & (x+2) \\ \hline \end{array}$$

- b. Write for 3 consecutive even integers:

$$\begin{array}{ccc} 2 & 4 & 6 \\ \hline x & (x+2) & (x+4) \\ \hline \end{array}$$

- c. Write for 3 consecutive odd integers:

$$\begin{array}{ccc} 3 & 5 & 7 \\ \hline x & (x+2) & (x+4) \\ \hline \end{array}$$

Section 5. Consecutive Integers - "Whose Sum Are" Questions

15. Find three consecutive integers whose sum are 99.

$$\begin{array}{l} x = 1^{st} \text{ int} = 32 \\ (x+1) = 2^{nd} \text{ int} = 33 \\ (x+2) = 3^{rd} \text{ int} = 34 \end{array} \quad \begin{array}{l} x + (x+1) + (x+2) = 99 \\ x + x + 1 + x + 2 = 99 \\ 3x + 3 = 99 \\ -3 \quad -3 \\ \hline 3x = 96 \\ x = 32 \end{array}$$

$$\begin{array}{l} 32 + 33 + 34 = 99 \\ 99 = 99 \checkmark \end{array}$$

16. Find three consecutive odd integers whose sum is 255.

$$\begin{array}{l} x = 1^{st} \text{ Odd int} = 83 \\ (x+2) = 2^{nd} \text{ Odd int} = 85 \\ (x+4) = 3^{rd} \text{ Odd int} = 87 \end{array} \quad \begin{array}{l} x + (x+2) + (x+4) = 255 \\ x + x + 2 + x + 4 = 255 \\ 3x + 6 = 255 \\ -6 \quad -6 \\ \hline 3x = 249 \\ x = 83 \end{array}$$

17. Find four consecutive even integers whose sum are 60.

$$\begin{aligned}
 x &= 1^{\text{st}} \text{ Even} & x + (x+2) + (x+4) + (x+6) &= 60 \\
 (x+2) &= 2^{\text{nd}} \text{ Even} & x + x + 2 + x + 4 + x + 6 &= 60 \\
 (x+4) &= 3^{\text{rd}} \text{ Even} & 4x + 12 &= 60 \\
 (x+6) &= 4^{\text{th}} \text{ Even} & &
 \end{aligned}$$

Section 5. Consecutive Integers - "Such That" Problems

5. Find three consecutive integers ^{key} such that ^{equation} the sum of the first and the third integer is 40.

$$\begin{aligned}
 x &= 1^{\text{st}} \text{ Int} = 19 & x + (x+2) &= 40 & x &= 19 & 19 + 21 &= 40 \\
 (x+1) &= 2^{\text{nd}} \text{ Int} = 20 & x + x + 2 &= 40 & & & 40 &= 40 \\
 (x+2) &= 3^{\text{rd}} = 21 & 2x + 2 &= 40 & & & & \\
 & & -2 & -2 & & & & \\
 & & 2x &= 38 & & & &
 \end{aligned}$$

6. Find two consecutive odd integers such that twice the smaller is 26 less than 3 times the larger.

7. Find three consecutive integers such that the sum of the first two is 24 more than the third

8. Find two consecutive integers such that 4 times the larger ⁺ exceeds 3 times the smaller ⁺ (by) 23.

$$\begin{aligned}
 x &= 1^{\text{st}} \text{ Int} = 19 & 4(x+1) &= 3x + 23 & x &= 19 \\
 (x+1) &= 2^{\text{nd}} \text{ Int} = 20 & 4x + 4 &= 3x + 23 & & \\
 & & -3x & -3x & & \\
 & & x + 4 &= 23 & & \\
 & & -4 & -4 & &
 \end{aligned}$$

Homework Section

Section(s)	Page(s)	Problem(s)
3.1	186 → 187	11 → 129 E.O.O.*

*E.O.O. = Every Other Odd