

Ch. 2.6 Ratios, Rates & Conversions

- Ratio - comparison of two numbers
- can be written as $\frac{a}{b}$, $a:b$ or a to b
 - however $b \neq 0$
 - a ratio that compares quantities measured in different units is called a rate.
 - unit rate is a rate with a denominator of 1 unit

→ * Review Problem 1 pg. 116

→ * Got it? #1 pg. 117

$$\text{Store B: } \frac{42}{4} = \frac{\$10.50}{1 \text{ shirt}}$$

No, the best deal for a shirt is still Store C.

→ Conversion factor - ratio of 2 equivalent measures in different units which is always equal to 1

* Review Problem 2 on pg. 117

* Got it? #2 on pg. 117

$$1250 \text{ cm} \cdot \frac{1 \text{ m}}{100 \text{ cm}} = 12.5 \text{ m}$$

* Writing equations that include the units is called unit analysis or dimensional analysis

* Review Problem 3 on pg. 117

* Got it? #3 pg. 118

$$a) 1450 \text{ ft} \cdot \frac{1 \text{ m}}{3.28 \text{ ft}} = 442 \text{ m}$$

$$b) \$325 \cdot \frac{0.63 \text{ euro}}{\$1} = 204.75$$

or about
205 euros

* Review Problem 4 on pg. 118

* Got it? #4 pg. 118

$$a) 100 \text{ ft} \cdot \frac{1 \text{ mi}}{5280 \text{ ft}} \cdot \frac{3600 \text{ s}}{3.1 \text{ s}} \cdot \frac{1 \text{ hr}}{3600 \text{ s}} = \frac{100}{5280} \cdot \frac{3600}{3.1} \approx 22 \frac{\text{mi}}{\text{hr}}$$

2.6 Algebraic Expressions & Equations: Finding Consecutive Integers

Notes:

When you count by ones from any integer, you are counting consecutive integers. You can represent consecutive integers as x , $x+1$, $x+2$, $x+3$...

The sum of three consecutive integers is -255. What are the three integers?

Problems:

Write an expression for the following.

1. The sum of three consecutive even integers.
2. The sum of an even integer and the next even integer.
3. The sum of an odd integer and the next integer.
4. The sum of an even integer and two times the next even integer.
5. The sum of an integer and three times the next integer.
6. The sum of an even integer and the next two even integers.
7. The sum of an integer and $\frac{1}{5}$ of the next integer.

Translate into an equation and solve.

8. The sum of two consecutive even integers is 94. What are the integers?
9. The sum of three consecutive odd integers is 123. What are the integers?

2.6

Algebraic Expressions & Equations: Finding Consecutive Integers

Key

Notes:

When you count by ones from any integer, you are counting consecutive integers. You can represent consecutive integers as x , $x+1$, $x+2$, $x+3$...

The sum of three consecutive integers is -255. What are the three integers?

$$x + (x+1) + (x+2) = -255$$

Problems:

$$3x + 3 = -255$$

$$3x = -258$$

$$x = -86$$

$$x+1 = -85$$

$$x+2 = -84$$

$$(-84, -85, -86)$$

Write an expression for the following.

1. The sum of three consecutive even integers.

$$x + (x+2) + (x+4)$$

2. The sum of an even integer and the next even integer.

$$x + (x+2)$$

3. The sum of an odd integer and the next integer.

$$x + (x+1)$$

4. The sum of an even integer and two times the next even integer.

$$x + 2(x+2)$$

5. The sum of an integer and three times the next integer.

$$x + 3(x+1)$$

6. The sum of an even integer and the next two even integers.

$$x + (x+2) + (x+4)$$

7. The sum of an integer and 1/5 of the next integer.

$$x + \frac{1}{5}(x+1)$$

Translate into an equation and solve.

8. The sum of two consecutive even integers is 94. What are the integers?

$$x + (x+2) = 94$$

$$2x + 2 = 94$$

$$2x = 92$$

$$x = 46$$

$$(46, 48)$$

9. The sum of three consecutive odd integers is 123. What are the integers?

$$x + (x+2) + (x+4) = 123$$

$$3x + 6 = 123$$

$$3x = 117$$

$$x = 39$$

$$(39, 41, 43)$$

* Units of Measure on pg. 814

2.6 pg. 119 #12-38 even & #39 & 43

$$(12) 168 \text{ hr} \cdot \frac{1 \text{ day}}{24 \text{ hr}} = 7 \text{ days}$$

$$(14) 200 \text{ cm} \cdot \frac{1 \text{ m}}{100 \text{ cm}} = 2 \text{ m}$$

$$(16) 1500 \text{ mL} \cdot \frac{1 \text{ L}}{1,000 \text{ mL}} = 1.5 \text{ L}$$

$$(18) 5 \text{ kg} \cdot \frac{1 \text{ lb}}{0.454 \text{ kg}} = 11 \text{ lb}$$

$$(20) 3 \text{ g} \cdot \frac{0.946 \text{ L}}{1 \text{ g}} = 2.838 \text{ L} \text{ or about } 2.8 \text{ L}$$

$$(22) 2 \text{ ft} \cdot \frac{0.305 \text{ m}}{1 \text{ ft}} \cdot \frac{100 \text{ cm}}{1 \text{ m}} = 61 \text{ cm}$$

$$(24) \frac{\$6.30}{10} = \$0.63 \text{ per rason} \cdot \frac{1 \text{ week}}{7 \text{ days}} = \$0.09 \text{ a day}$$

$$(26) 2.2 \text{ kg} \cdot \frac{1 \text{ lb}}{0.454 \text{ kg}} = \text{about } 4.8 \text{ lbs.}$$

$$(28) 2 \text{ qt} \cdot \frac{1 \text{ gal}}{4 \text{ qt}} = \frac{1 \text{ gal}}{2 \text{ min}} \cdot \frac{1 \text{ min}}{60 \text{ sec}} = \frac{1 \text{ gal}}{120 \text{ sec.}}$$

$$(30) \frac{60 \text{ ft}}{1 \text{ sec}} \cdot \frac{0.305 \text{ m}}{1 \text{ ft}} \cdot \frac{1 \text{ km}}{1,000 \text{ m}} = 0.0183 \text{ km} \cdot \frac{3,600 \text{ sec}}{1 \text{ h}}$$

$$= 65.88 \text{ km} \text{ or } 65.8 \text{ km/h}$$

$$(32) \frac{63 \text{ in}}{1 \text{ in}} \cdot \frac{2.54 \text{ cm}}{1 \text{ in}} = 160 \text{ cm}$$

about

63 in is greater

$$(34) \frac{\$0.87}{\text{day}} \cdot \frac{365 \text{ day}}{1 \text{ yr}} = \$317.55 \text{ per year}$$

$$(36) \frac{9 \text{ yd}}{1 \text{ yd}} \cdot \frac{3 \text{ ft}}{1 \text{ yd}} = 27 \text{ ft}$$

The numbers are correct but the units are reversed in the conversion factor.

(38) (a) greater than (b) less than (c) less than

$$(39) \$39.95 \text{ US} \cdot \frac{39.57 \text{ R}}{\$1} = 1580.82 \text{ Rupees}$$

$$\$39.95 \text{ US} \cdot \frac{0.50 \text{ GBP}}{\$1} = 19.975 \text{ Pounds}$$

$$19.98 \text{ Pounds}$$

$$(43) 1 \text{ mm} + 1 \text{ cm} + 1 \text{ in.} + 1 \text{ ft.} + 1 \text{ yd} + 1 \text{ m}$$

$$1 \text{ mm} + 10 \text{ mm} + 25.4 \text{ mm} + 304.8 \text{ mm} + 914.4 \text{ mm} + 1,000 \text{ mm} = 2,255.6 \text{ mm}$$