HOMEWORK Solutions...

Name : _____ Score : _____

Teacher : _____ Date : _____

Converting English and Metric

1)	22	miles	=	~~35.41~~ 35.40	kilometers
2)	12	yards	=	10.97	meters
3)	10	miles	=	16.09	kilometers
4)	12.12	miles	=	19.5	kilometers
5)	5.91	inches	=	15	centimeters
6)	9.84	yards	=	9	meters
7)	7	inches	=	17.78	centimeters
8)	3.83	yards	=	3.5	meters $3.5m \times \frac{1.094\ yd}{1\ m}$
9)	6.5	inches	=	16.5	centimeters
10)	5.28	miles	=	8.5	kilometers
11)	4.92	yards	=	4.5	meters
12)	4	miles	=	6.44	kilometers
13)	11	yards	=	10.06	meters
14)	2	yards	=	1.83	meters
15)	14.5	inches	=	36.83	centimeters
16)	17	inches	=	43.18	centimeters
17)	11.5	miles	=	18.51	kilometers
18)	20.23	yards	=	18.5	meters
19)	4.92	inches	=	12.5	centimeters
20)	13.05	miles	=	21	kilometers

Math-Aids.Com

Problems with Homework?

Worksheet & #8 page 151

1. a) $3 \text{ miles} \times \frac{1760\ yd}{mi} = 5280\ yd$

b) $18 yd \times \frac{3\ ft}{1\ yd} = 54\ ft$

c) $23 ft \times \frac{12\ in}{1\ ft} = 276 in$

d) $90 in \times \frac{1\ ft}{12\ in} = 7.5 ft$

e) $275 ft \times \frac{1\ yd}{3\ ft} = 91.\overline{6}\ yd$

f) $1000 yd \times \frac{1\ mi}{1760\ yd} = 0.57 mi$

g) $525\,350 in \times \frac{1\ ft}{12\ in} \times \frac{1\ yd}{3\ ft} \times \frac{1\ mi}{1760\ yd} = 8.29 mi$

h) $200 yd \times \frac{3\ ft}{1\ yd} = 600 ft$

i) $1.5 mi \times \frac{1760\ yd}{mi} \times \frac{3\ ft}{1\ yd} = 7920 ft$

#2 ÷12

a) 155 in = 12'11"

b) $\frac{550}{3}$ ft = 183 yd 1 ft

183 x 3 = 549

c) $\frac{850}{12}$" = 70 ' 10 "

d) $\frac{3500}{1760}$ yd = 1 mi 1740 yd

e) $10\frac{3}{4}$ yd = ____ ft

10.75×3 $32.25 \left(32\frac{1}{4}\right)$

$10 \times 3 = 30$

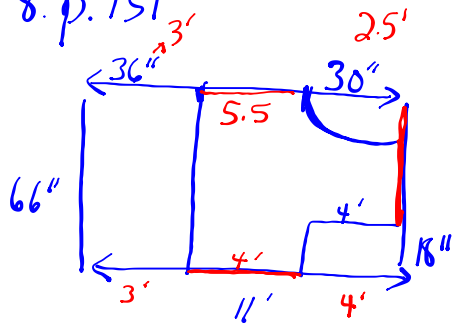
$\frac{3}{4} \times 3 = \frac{9}{4}$

$30\frac{9}{4} = 32\frac{1}{4}$

$\frac{43}{4} \times 3 = \frac{129}{4}$

$= 32\frac{1}{4}$

#8. p. 151



66 - 18 = 48"

= 4'

11 - 3 - 4 = 4'

Baseboard = 4 + 4 + 5.5

= 13.5'

Cost Materials

13.5' x $6.50/ft = $87.75

Labour

2.5 x $45/hr = $112.50

Mark Up

$87.75 x 0.15 = 13.16

$213.41

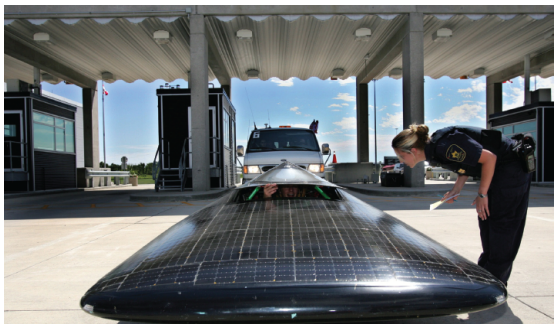
4.2 - Converting Measurements

Make Connections

Two cars are driven in opposite directions from a Canada/United States border crossing.
In one hour, Hana drove 62 mi. south while Farrin drove 98 km north.
How could you determine which vehicle travelled farther from the border?

$62\text{ mi} \times \frac{1.6093\text{ km}}{\text{mi}} = 99.77\text{ km}$

Hana drove further



Each measurement in the imperial system relates to a corresponding measurement in the SI system.

This table shows some approximate relationships between imperial units and SI units.

SI Units to Imperial Units	Imperial Units to SI Units
1 mm ≐ ?	1 in. ≐ ?
1 cm ≐ ?	1 ft. ≐ ?
	1 ft. ≐
1 m ≐ ?	1 yd. ≐ ?
1 m ≐	1 yd. ≐
1 km ≐ ?	1 mi. ≐ ?

We can use the data in the table above to convert between SI and imperial units of measure.

1.3 Relating SI and Imperial Units

THE CONVERSION FACTORS BETWEEN SI AND IMPERIAL UNITS

SI to Imperial	*Imperial to SI*
1 mm = 0.0394 in	1 in = 25.4 mm
1 cm = 0.3937 in	1 inch = 2.54 cm
1 m = 3.2808 ft	1 ft = 0.3048 m
1 m = 1.0936 yd	1 yd = 0.9144 m
1 km = 0.6214 mi	1 mi = 1.6093 km

IMPORTANT CONVERSIONS...

1 m = 1.0936 yd

1 mi. = 1.6093 km

1 in. = 2.54 cm

PRACTICE: Concerting IMPERIAL to METRIC

Convert each measurement. Answer to the nearest tenth.

a) 16 in. to centimetres
b) 4 ft. to metres
c) 5 yd. to metres
d) 1650 yd. to kilometres
e) 6 mi. to kilometres
f) 2 in. to millimetres

a) $16\text{ in} \times \frac{2.54\text{ cm}}{1\text{ in}}$

b) $4\text{ ft} \times \frac{1\text{ yd}}{3\text{ ft}} \times \frac{1\text{ m}}{1.0936\text{ yd}} = 1.22\text{ m}$

c) $5\text{ yd} \times \frac{1\text{ m}}{1.0936\text{ yd}} = 4.57\text{ m}$

d) $1650\text{ yd} \times \frac{\text{m}}{1.0936\text{ yd}} \times \frac{1\text{ km}}{1000\text{ m}} = 1.51\text{ km}$

1.3 Relating SI and Imperial Units

e) $6\text{ mi} \times \frac{1.6093\text{ km}}{1\text{ mi}} = 9.56\text{ km}$

f) $2\text{ in} \times \frac{2.54\text{ cm}}{1\text{ in}} \times \frac{10\text{ mm}}{1\text{ cm}} = 50.8\text{ mm}$

PRACTICE: Concerting METRIC to IMPERIAL

Convert each measurement.

a) 25 mm to the nearest inch
b) 2.5 m to the nearest foot
c) 10 m to the nearest yard
d) 150 km to the nearest mile

a) $25\text{mm} \times \frac{1\text{ cm}}{10\text{ mm}} \times \frac{\text{in}}{2.54\text{ cm}} = 0.98\text{ in}$

b) $2.5\text{m} \times \frac{1.0936\text{ yd}}{1\text{ m}} \times \frac{3\text{ ft}}{1\text{ yd}} = 8.20\text{ ft}$

c) $10\text{m} \times \frac{1.0936\text{ yd}}{\text{m}} = 10.94\text{ yd}$

d) $150\text{ Km} \times \frac{\text{mi}}{1.6093\text{ Km}} = 93.21\text{ mi}$

1.3 Relating SI and Imperial Units

Example 1 Converting from Metres to Feet

A bowling lane is approximately 19 m long.

What is this measurement to the nearest foot?

SOLUTION A length of 19 m is approximately 62 ft.

(Erase to reveal)

$19\text{m} \times \frac{1.0936\text{ yd}}{\text{m}} \times \frac{3\text{ ft}}{1\text{ yd}} = 62.34\text{ ft}$

CHECK YOUR UNDERSTANDING

1.3 Relating SI and Imperial Units

TRY THIS ONE...

The tallest structure in Canada is the CN Tower in Toronto. It is 553.3 m tall. The tallest structure in the United States is the Willis Tower, previously known as the Sears Tower, in Chicago. It is 1451 ft. tall.

a) Determine the height of the CN Tower in feet and the height of the Willis Tower in metres.
b) Which structure is taller? Explain how you know.
c) Determine the difference in the heights of the structures, in metres and to the nearest foot.

a) $553.3\text{ m} \times \frac{1.0936\text{ yd}}{\text{m}} \times \frac{3\text{ ft}}{1\text{ yd}} = 1815.27\text{ ft}$

$1451\text{ ft} \times \frac{1\text{ yd}}{3\text{ ft}} \times \frac{\text{m}}{1.0936\text{ yd}} = 442.27\text{ m}$

b) CN Tower 1815.27 ft compared to 1451 ft

c) $1815.27 - 1451 = 364.27\text{ ft}$

$553.3\text{ m} - 442.27 = 111.03\text{ m}$

1.3 Relating SI and Imperial Units

Example 2 Converting between Miles and Kilometres

After meeting in Emerson, Manitoba, Hana drove 62 mi. south and Farrin drove 98 km north. Who drove farther?

SOLUTION

(Erase to reveal)

See earlier in lesson

CHECK YOUR UNDERSTANDING

1.3 Relating SI and Imperial Units

TRY THIS ONE...

The Fraser River is approximately 1375 km long.
The Tennessee River is approximately 886 mi. long.
Which river is longer? Justify your answer.

$886\,mi \times \frac{1.6093\,km}{mi} = 1425.84\,km$

Tennessee River is longer.

1.3 Relating SI and Imperial Units

Example 3 Solving a Problem that Involves Unit Conversions

Alex is 6 ft. 2 in. tall. To list his height on his driver's license application, Alex needs to convert this measurement to centimetres.

What is Alex's height to the nearest centimetre?

SOLUTION and esti Alex is approximately ~~185~~ 188 cm tall.
swer is reasonable.
(Erase to reveal)

$6\,ft\ 2\,in = 6 \times 12 + 2$
$= 74''$

$74'' \times \frac{2.54\,cm}{in} = 187.96\,cm$
$= 188$

CHECK YOUR UNDERSTANDING

1.3 Relating SI and Imperial Units

Example 4 Estimating and Calculating Using Unit Conversions

A truck driver knows that her semitrailer is 3.5 m high. The support beams of a bridge are 11 ft. 9 in. high. Will the vehicle fit under the bridge? Justify the answer.

SOLUTION

(Erase to reveal)

350 cm = 11.4829… ft.

This measurement is a little less than $11\frac{1}{2}$ ft. or 11 ft. 6 in., so the vehicle will fit under the bridge

$3.5\text{ m} \times \frac{1.0936\text{ yd}}{\text{m}} \times \frac{3\text{ ft}}{1\text{ yd}} = 11.4828\text{ ft}$

$= 11.5'$

$= 11'6''$

CHECK YOUR UNDERSTANDING

1.3 Relating SI and Imperial Units

TRY THIS ONE...

A retail fabric store advertises a storewide sale. It lists a certain material for $0.89/yd. A fabric warehouse is selling the same material for $0.93/m.

a) Which store has the better price?

b) Use mental math and estimation to justify that the answer is reasonable.

$\$0.89/\text{yd} \times \frac{1.0936\text{ yd}}{\text{m}} = \$0.97/\text{m}$

The warehouse has the better price.

1.3 Relating SI and Imperial Units

LAND AREAS...

The imperial unit to measure an area of land is the *acre*. During the initial agricultural expansion of the western provinces, the Canadian government offered 160 acres of land free to settlers who were willing to immigrate to Canada. Today, Canada uses the *hectare* to measure land area:

1 hectare ≐ 2.471 acres

a) How many hectares did each settler receive?

b) One hundred sixty acres is a square with a side length of one-half a mile. How many hectares are in one square mile?

a) $160 \text{ acres} \times \frac{1 \text{ hectare}}{2.471 \text{ acres}} = 64.75 \text{ hectares}$

b)

$4(64.75) = 259$ hectares

1.3 Relating SI and Imperial Units

HOMEWORK...

Page 159: #1 - 7

CHECK YOUR UNDERSTANDING

1. A Canadian football field is approximately 59 m wide.

   What is this measurement to the nearest foot?

CHECK YOUR UNDERSTANDING

2. After meeting in Osoyoos, B. C., Takoda drove 114 km north and Winona drove 68 mi. south. Who drove farther?

CHECK YOUR UNDERSTANDING

3. Nora knows that she is 5 ft. 7 in. tall.

   a) What height in centimetres will she list on her driver's license application?

   b) Use mental math and estimation to justify that the answer is reasonable.

CHECK YOUR UNDERSTANDING

4. A truck driver knows that his load is 15 ft. wide. Regulations along his route state that any load over 4.3 m wide must have wide-load markers and an escort with flashing lights. Does this vehicle need wide-load markers? Justify your answer.

Attachments

Worksheet - Converting Measurements.docx