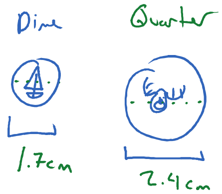
Homework

February 3, 2017 11:25 AM

#15 #13 #11

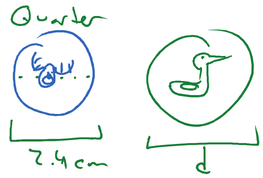
11) a)



$$\frac{2.4}{1.7} = 1.4$$

This tells us that the Quarter is 1.4 times the size of the Dime.

b)



$$2.4 \times \frac{d}{2.4} = 1.4 \times 2.4$$

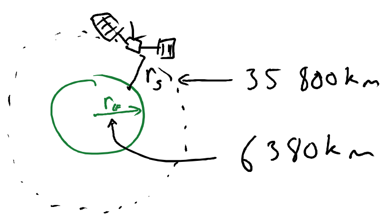
$$d = 1.4 \times 2.4$$

$$d = 3.4\ cm$$

d when measured is 2.6cm

The ratio does not apply

13)



b) $C_E = 2\pi r_E$

$= (2)(\pi)(6380)$

$C_E = 40,086\ km$

c) $r = r_E + r_S$

$= 35800 + 6380$

$r = 42180$

$C_S = 2\pi r$

$= 2\pi(42180)$

$= 265,025\ km$

d) $v = \frac{d}{t}$

r v

$V_E = \frac{C_E}{24hr}$

$= \frac{40086}{24}$

$= 1670\ km/hr$

$V_S = \frac{C_S}{24hr}$

$= \frac{265025\ km}{24\ hr}$

$= 11043\ km/hr$

15)

focal length = 45mm

Altitude = 305m

Length of Crater (Photo) = 35mm

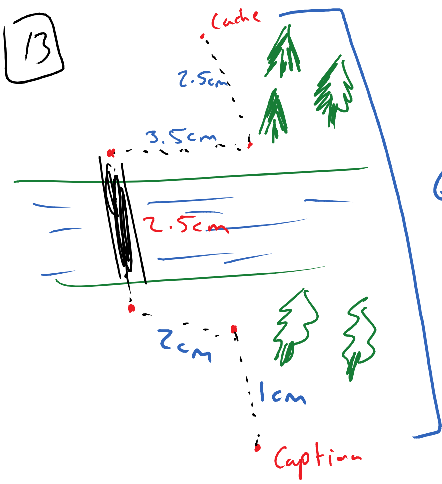
$SF = \frac{305m}{45mm}$

45mm = 305m

$$35\cancel{mm} \times \frac{305m}{45\cancel{mm}} = 237m$$

$$35\,\cancel{mm} \times \frac{305\,m}{45\,\cancel{mm}} = \underline{\underline{237\,m}}$$

$\frac{1,2}{13\ \&\ 15}$ $\boxed{13}$



on the map

6cm = 500yd

$$d_T = 1+2+2.5+3.5+2.5$$
$$= 11.5\,cm$$

$$11.5\,\cancel{cm} \times \frac{500\,yd}{6\,\cancel{cm}} = \underline{\underline{958\,yd}}$$

$\boxed{15}$

$$1\,AU = 92\,955\,887.6\,mi$$

a) $$0.1018\,AU \times \frac{92\,955\,887.6}{1\,AU} = 9462909.4\,mi$$

$$1.315\,\cancel{AU} \times \frac{92955887.6\,mi}{1\,\cancel{AU}} = 122236992.2\,mi$$

b)

$$\begin{array}{r} 122236992.2 \\ -\ 9462909.4 \\ \hline 112774083\,mi \end{array}$$

1.1 - Si Units

February 2, 2017 10:44 AM

SI Units (*Système international d'unités)* the standard international system of units were created in the 1700's during the French Revolution.

This system uses predetermined prefixes that scale a measurement

Prefix	Scale factor (Scientific Notation)	Scale Factor
n: nano	**$x10^{-9}$**	**0.000000001**
μ: micro	**$x10^{-6}$**	**0.000001**
m: milli	**$x10^{-3}$**	**0.001**
c: centi	**$x10^{-2}$**	**0.01**
d: deci	**$x10^{-1}$**	**0.1**
da: deca	**$x10^{1}$**	**10**
h: hecta	**$x10^{2}$**	**100**
k: kilo	**$x10^{3}$**	**1000**
M: mega	**$x10^{6}$**	**1000000**
G: giga	**$x10^{9}$**	**1000000000**

<u>Measuring Length</u>

Lengths are always measured in meters. We use a prefix to help scale the measurement.

34 km = $34\,(1000)\,m$

$34{,}000\,m$

1km = 1000m

$$34\,\cancel{km} \times \frac{1000\,m}{1\,\cancel{km}} = 34000\,m$$

540 cm = $540\,(0.01)\,m$

$5.4\,m$

1m = 100cm

$$540\,\cancel{cm} \times \frac{1\,m}{100\,\cancel{cm}} = 5.4\,m$$

4678 mm = $4678\,(0.001)\,m$

$4.678\,m$

1m = 1000mm

$$4678\,mm \times \frac{1\,m}{1000\,mm} = 4.678\,m$$

c: 0.01

3 cm = 3 ( )

c: 0.01

$1m = 100cm$

3 cm = $3(0.01)m$ ✓

$0.03m$

$3\cancel{cm} \times \frac{1m}{100\cancel{cm}} = 0.03m$

k: 1000

$1km = 1000m$

0.56km = $0.56(1000)m$

$560m$

$0.56\cancel{km} \times \frac{1000m}{1\cancel{km}} = 560m$

Mass in SI units is measured in grams

<u>Equivalency Equations</u>

Yesterday you created your own equivalency Equations.

$20cm = 2000km$

$100\cancel{cm} \times \frac{2000km}{20\cancel{cm}} = 10{,}000km$

We can do the same with our different SI units.

1km = 1000m

1m = 100cm

1cm = 10mm

Etc.

We also use equivalency equations on maps

Referents: A referent is a personal measurement that you can use to make estimates.

The width of your pinky finger is approximately 1 cm
What would be some other referents?

1mm $\simeq$ Thickness of a finger nail

1 cm $\simeq$ width of the pinky finger

1 m $\simeq$ large Step

1km $\simeq$ 3 city blocks

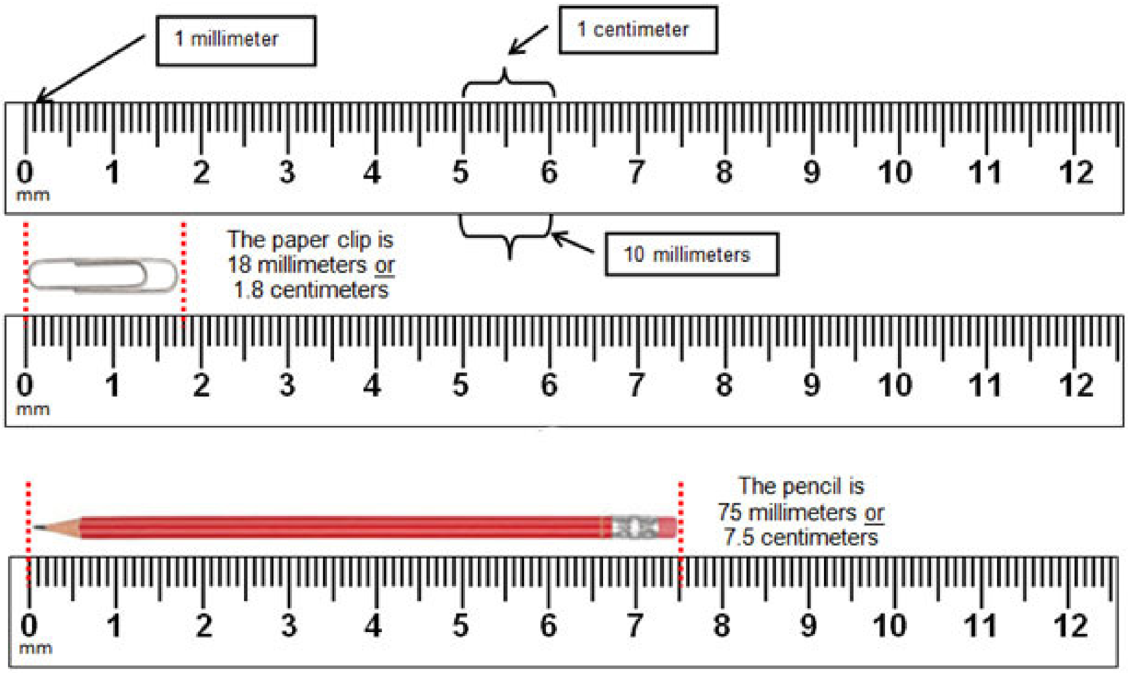
HW: 1-15 odd
pg 15

Using your referents: determine the following

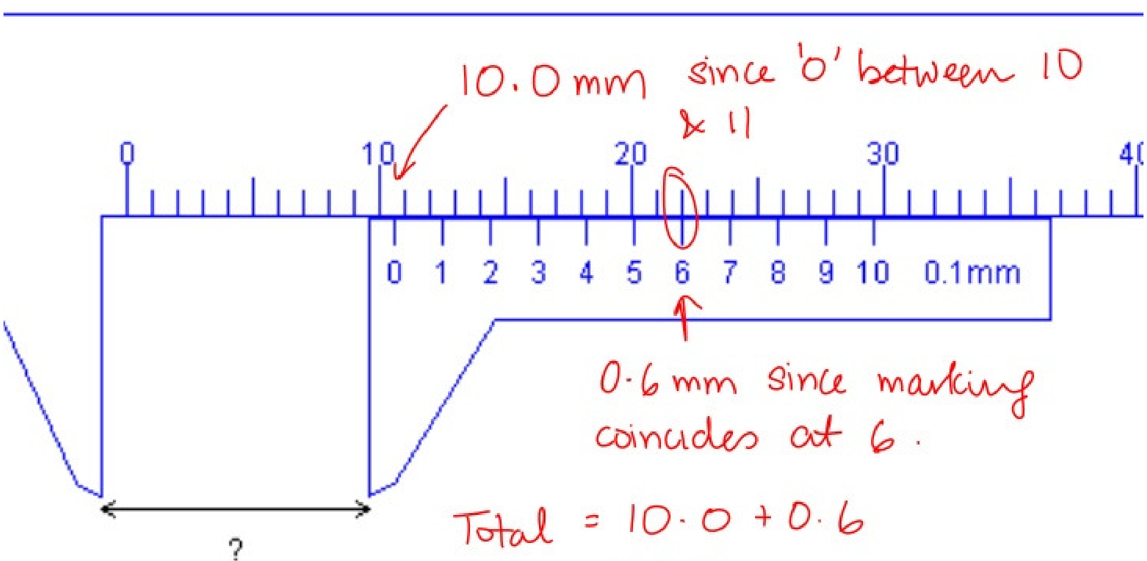
The height of your text book (in cm) = 20 ~ 26 cm

The perimeter of the classroom (in m)= 34 ~ 42 m

Reading a ruler



Reading a Caliper



10.0 mm since '0' between 10 & 11

0.6 mm since marking coincides at 6.

Total $= 10.0 + 0.6$
$= 10.6$ mm

#11

ratios

1.2 - Imperial Measurements

February 2, 2017 4:14 PM

Imperial Measurements came into being in 1824. They were a standardized version of the Winchester standard units of the 15th century.

Lengths

Inch (in or ")	**12 inches = 1 foot**
Feet (ft. or ')	**3 feet = 1 yard**
Yard (yd)	**1760 yards = 1 mile**
Mile (mi)	5280 ft = 1 mi

1760 yards = 1 mile

1760 (3 feet) = 1 mile

5280 ft = 1 mi

Examples: Do the following conversions

8ft to inches

$8\cancel{ft} \times \frac{12\text{ in}}{1\cancel{ft}}$

12 in = 1 ft

$= 96\text{ in}$

62 yd to miles

1760 yd = 1 mi

$62\cancel{yd} \times \frac{1\text{ mi}}{1760\cancel{yd}} = 0.035\text{ mi}$

234 yd to feet

3 ft = 1 yd

$234\cancel{yd} \times \frac{3\text{ ft}}{1\cancel{yd}} = 702\text{ ft}$

5.5 feet to inches

12 in = 1 ft

$5.5\cancel{ft} \times \frac{12\text{ in}}{1\cancel{ft}} = 66\text{ in}$

3.5 yards to inches

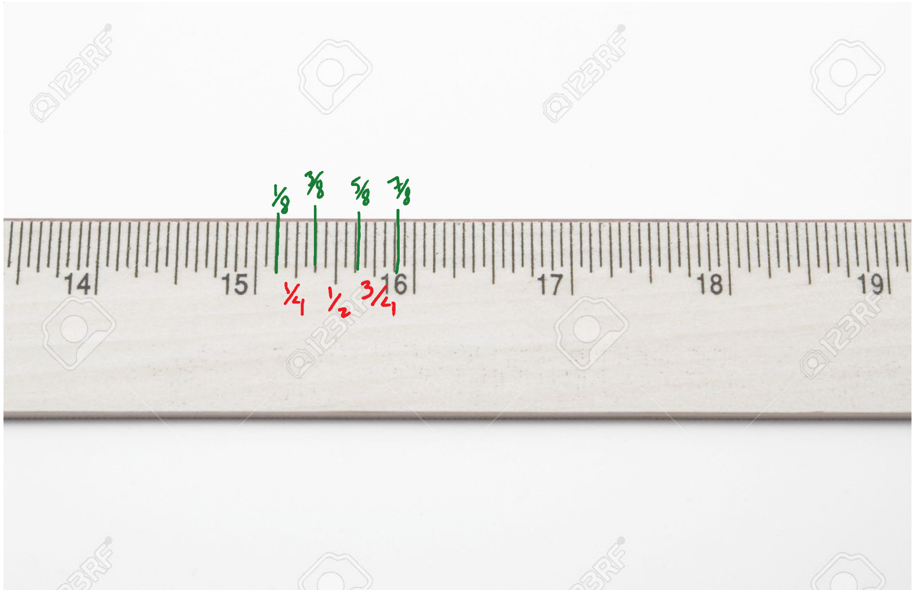
3 ft = 1 yd

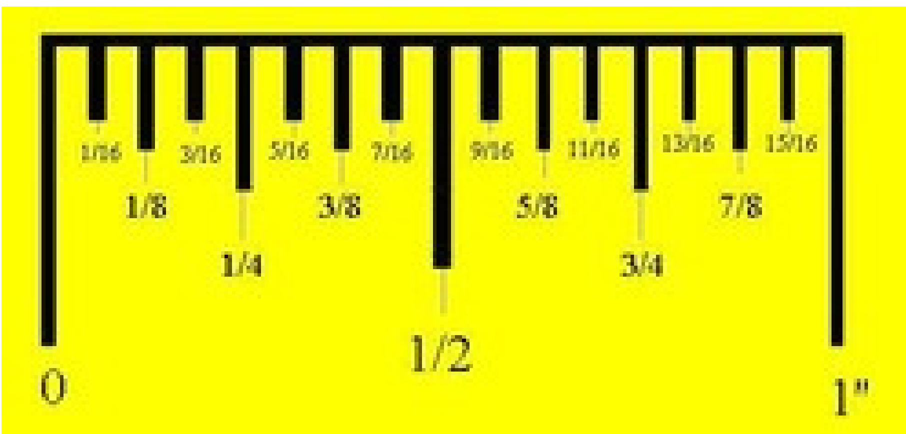
12 in = 1 ft

$3.5\cancel{yd} \times \frac{3\cancel{ft}}{1\cancel{yd}} \times \frac{12\text{ in}}{1\cancel{ft}} = 3.5 \times 3 \times 12\text{ in}$

$= 126\text{ in}$

Using imperial Units on a Ruler





Referents

Inch: width of your thumb

Foot: Approximate out how many of your feet equal 1 imperial foot

1 large foot
1 Buckham Size foot

You try:

Estimate the width of your text book using your thumb. ~9in

Estimate the length of your desk using your feet. ~5ft

Examples

Mr. Horncastles Westy, has wheels that have a diameter of 2.083 ft.

a) **What is the radius of these wheels in inches**

$d = 2r$

$\frac{2.083ft}{2} = \frac{2r}{2}$

$1.0415ft = r$

$12in = 1ft$

$1.0415ft \times \frac{12in}{1ft} = \underline{\underline{12.5in}}$

b) **What is the circumference in Yards?**

$6.54ft \times \frac{1yd}{}$

HW: Ch1.2 pg 29

$$1.0415 ft = r$$

b) What is the circumference in Yards?

$C = 2\pi r$

$= \pi(2r)$

$= \pi(2.083ft)$

$C = 6.54 ft$

$2r = d = 2.083ft$

$1 yd = 3ft$

$6.54ft \times \frac{1yd}{3ft}$

$= 2.18yd$

HW: Ch 1.2 pg 29
1-15 odd

C) How many times will the wheel fully rotate in 1 mile of driving?

$1mi = 1760yd$

$\frac{1760yd}{2.18yd} = 807$ full rotations

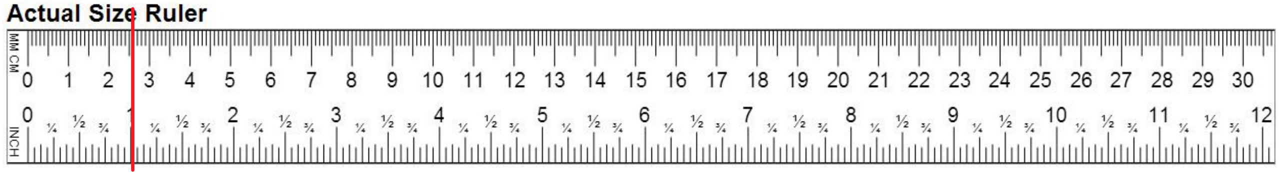
1.3 - Converting Between Imperial and SI

February 5, 2017 9:06 PM

Now that we have learned how to convert with in a measuring system, we are going to learn how to convert between Measuring systems.

Look at your ruler and see if you can create an equivalency relation for inches and centimeters.

Actual Size Ruler



1in = 2.54cm

These are the accepted conversations between Imperial and SI units. They should also be found in your yellow formula sheets.

Imperial to SI	**SI to Imperial**
1in. = 2.54 cm	1mm = 0.0394 in
1ft = 30.48cm	1cm = 0.3937 in
1yd = 0.9144m	1m = 3.281ft
1mi = 1.609km	1m = 1.094yd
	1km = 0.6214mi

Examples:
Convert the following

4.5 in to cm

$\boxed{1in = 2.54cm}$

$4.5\cancel{in} \times \frac{2.54cm}{1\cancel{in}} = \underline{\underline{11.43cm}}$

$\boxed{1cm = 0.3937in}$

$4.5\cancel{in} \times \frac{1cm}{0.3937\cancel{in}} = \underline{\underline{11.43cm}}$

13 mm to in

$1mm = 0.0394in$

$13\cancel{mm} \times \frac{0.0394in}{1\cancel{mm}} = \underline{\underline{0.512in}}$

5.8 km to yd

$1km = 0.6214mi$

$1mi = 1760yd$

$5.8km \times \frac{0.6214mi}{1km} = \underline{\underline{3.604mi}}$

k mi " "

$1km = 0.6214mi$

$1mi = 1760yd$

$km \rightarrow mi \rightarrow yd$

$1km = 0.6214mi$

$$5.8\,km \times \frac{0.6214\,mi}{1\,km} = \underline{\underline{3.604\,mi}}$$

$$3.604\,\cancel{mi} \times \frac{1760\,yd}{1\,\cancel{mi}} = \underline{\underline{6343\,yd}}$$

Mr. Horncastle likes to use old bottles to store his loose change. Which coins fit in the bottles?

fit
- ✓ A penny has a diameter of 0.75in ✓
- ✓ A dime has a diameter of 0.705in ✓
- ✓ A nickel has a diameter of 0.835in ✓

do not
- ✗ A quarter has a diameter of 0.07958ft = 0.955in
- ✗ A loonie has a diameter of 26.5mm. = 1.04in

The Bottles opening is 0.023m. = 0.906in

$\underline{1ft = 12in}$

$$0.07958\,\cancel{ft} \times \frac{12in}{1\,\cancel{ft}} = \underline{\underline{0.955\,in}}$$

$\underline{1in = 0.0394mm}$

$$26.5\,\cancel{mm} \times \frac{1in}{0.0394\,\cancel{mm}} = \underline{\underline{1.04\,in}}$$

$\underline{1m = 3.281ft}$

$$0.023\,\cancel{m} \times \frac{3.281ft}{1\,\cancel{m}} = 0.075463\,ft$$

$\underline{1ft = 12in}$

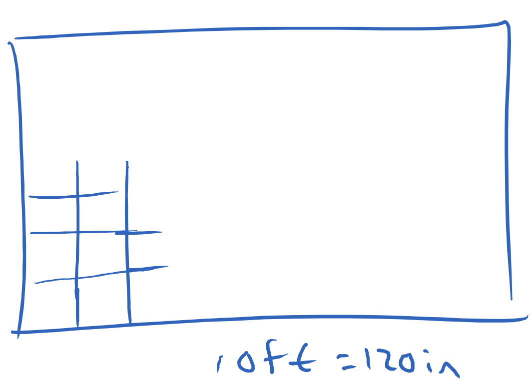
$$0.075463\,\cancel{ft} \times \frac{12\,in}{1\,\cancel{ft}} = \underline{\underline{0.906in}}$$

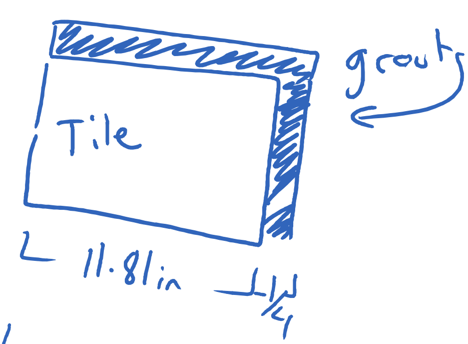
Mr. Horncastle has decided to retile his kitchen. The stone he wants to use is 30cm by 30cm and he wants to use a 1/4" grout line. If his kitchen floor space is 10ft x 8ft. How many tiles will he need? (assuming he doesn't break any, which he most certainly will, at least 10% of the tiles)

$1in = 2.54cm$

Draw a picture

$$30\,\cancel{cm} \times \frac{1in}{2.54\,\cancel{cm}} = 11.81\,in$$





10ft = 120in

11.81in $\frac{1}{4}$

$\boxed{1ft = 12in}$

$10ft \times \frac{12in}{1ft} = \underline{\underline{120in}}$

$8ft \times \frac{12in}{1ft} = 96in$

$11.81 + 0.25$

$\boxed{12.06in}$

both length and width of the tile plus grout

$\frac{120in}{12.06in} = 9.95$ tiles $= 10$ tiles

$\frac{96in}{12.06in} = 7.96$ tiles $= 8$ tiles

Total tiles $= 10 \times 8 = \underline{\underline{80 \text{ tiles}}}$

Homework
Ch:1.3 Page 42
1-15odd

Chapter 1 Quiz

February 8, 2017 10:09 AM

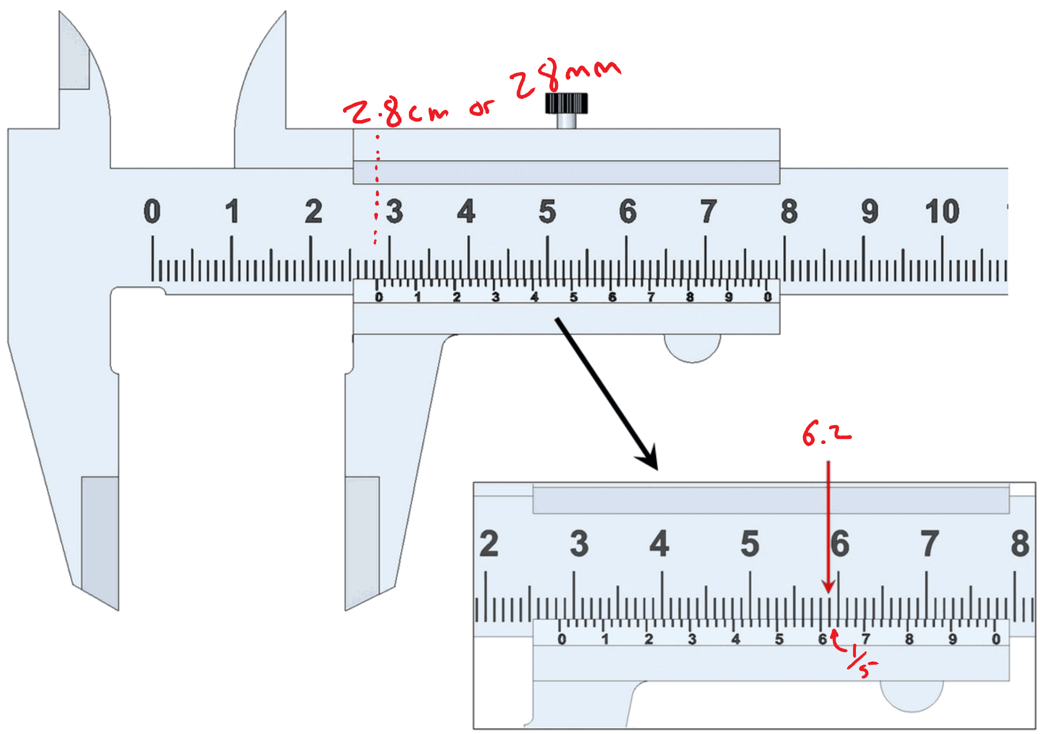
1. A student measures his stride to be 2 3/4 ft long

Calipers

February 9, 2017 8:02 AM

Metric Calipers

Fixed Scale (1mm divisions): Read the value on the fixed scale just to the left of the sliding scale zero
Sliding scale (0.1mm divisions): Read the value on the sliding scale that matches up with a line on the fixed scale



Combine these numbers together to get your accurate reading.

2.8cm 6.2 on the Sliding Scale

$\boxed{2.862\text{cm}}$

Task: Measure the width of a pencil, the thickness of your text book, ~~and the width of your finger~~.

Pencil:

7mm 6.4mm

11.55mm 9.0mm

11.55mm 9.0mm

Textbook:

27.75mm 30mm

27.5mm 29.3mm

Finger:

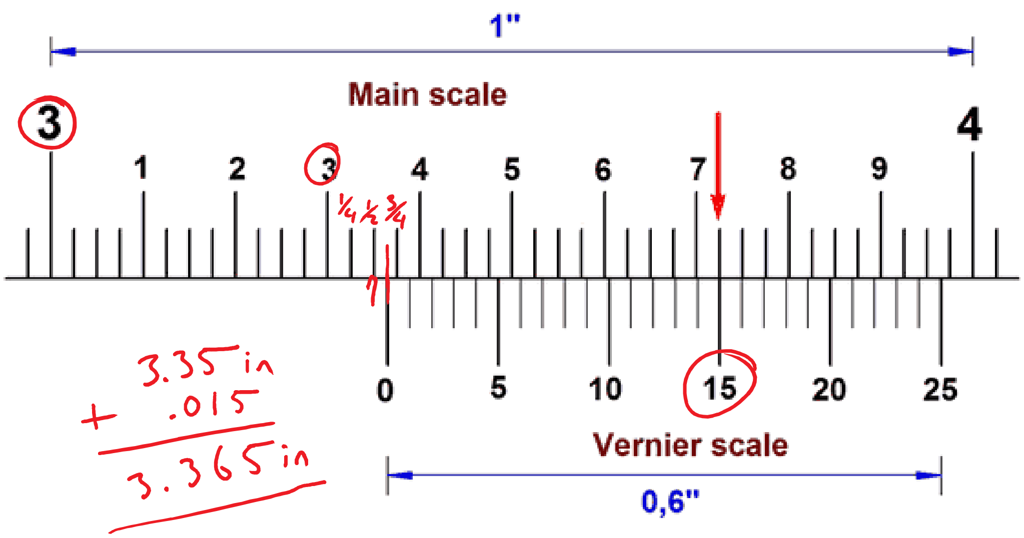
13.4mm 16.5mm

15.0mm 6.2mm

Imperial Calipers

Fixed scale (0.1in divisions): Read the value on the fixed scale that is just to the left of the sliding scale zero

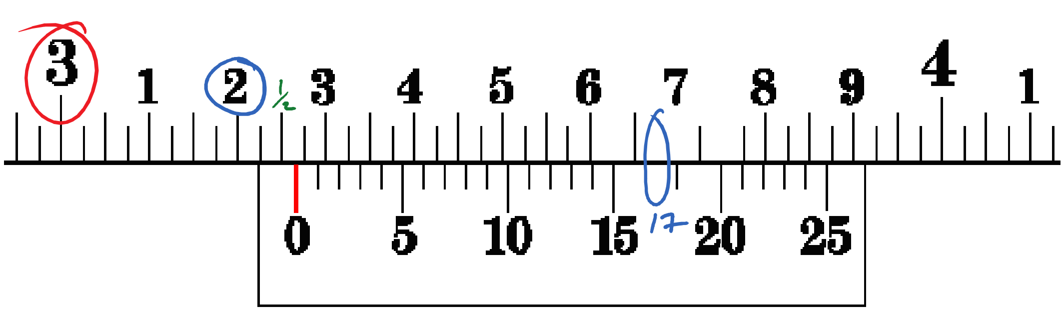
Sliding Scale (0.01in divisions): Read the value on the sliding scale that matches up with a line on the fixed scale.

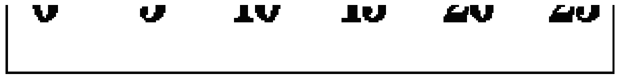


$$
\begin{array}{r}
3.35\text{ in} \\
+\ .015 \\
\hline
3.365\text{ in}
\end{array}
$$

Combine these numbers together to get your accurate reading.

Example:





3.237

2.67

2.69

2.68

$$\begin{array}{r} 3.25 \\ +\quad 17 \\ \hline 3.267 \text{ in} \end{array}$$

HW: Caliper Questions you skipped from 1.1 and 1.2 HW.
Chapter Review pg. 48 Questions: 1-13
Quiz tomorrow on chapter 1