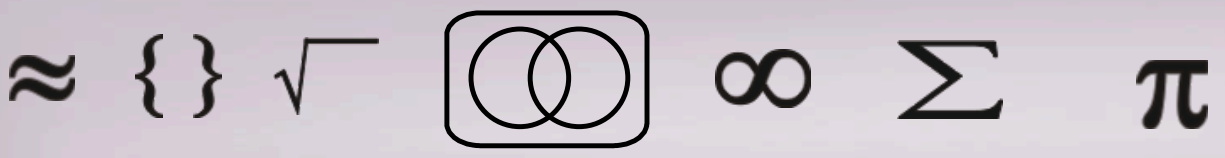

relative, absolute

random, systematic

Math 1030 #7a

Dealing With Uncertainty

significant digits

Significant Digits

accuracy, precsion

Rounding

Significant Digits are the digits in a numeric representation that represent actual measurements and therefore have meaning.

EX 1: State the number of ① significant digits and the ② implied precision.

a) 38.20 grams

① 4 sig. digits ② to the hundredths place

b) The University has 32,000 students enrolled.

① 2 sig. digits ② to the thousands place

c) The University has 3.20×10^4 students enrolled.

① 3 sig digits ② to the hundreds place

d) 5.1×10^5 centimeters

① 2 sig. digits ② to the ten-thousands place

e) 0.00513 miles

① 3 sig digits ② to the one-hundred-thousandth place

Practice Rounding

EX 2: Round the number 658.49215 to the nearest

a) Thousandth (digit is 2)
658.492 (since 1<5 round down)

b) Hundredth (digit is 9)
658.49 (since 2<5, round down)

c) Tenth (digit is 4)
658.5 (since 9≥5, round up)

d) One (digit is 8)
658 (since 4<5, round down)

e) Ten (digit is 5)
660 (because 8≥5, round up)

f) Hundred (digit is 6)
700 (because 5≥5, round up)

g) Thousand (digit is implied 0)
1000 (because 6≥5, round up)

Rounding with Significant Digits

EX 3: Round each to the specified number of significant digits.

a) 3.2 m x 4.81 m; give your answer with 2 significant digits.

$3.2(4.81) = 15.392 \Rightarrow 15\ m^2$

b) 250,000 x 531,800,000; give your answer with 3 significant digits.

$250{,}000(531{,}800{,}000)$
$=(2.5\times10^5)(5.318\times10^8)$
$=(2.5\times5.318)(10^5\times10^8)$
$=1329.5\times10^{13}$
$=1.3295\times10^{16}$

1.3295
w/ 3 sig digits
is 1.33

final answer:
1.33×10^{16}