

ASSIGNMENT: Measurement Review (part 2)

Name: Key
 Date: _____

1. Match the following terms with the best definition:

B accuracy

A. the margin of error of a measurement

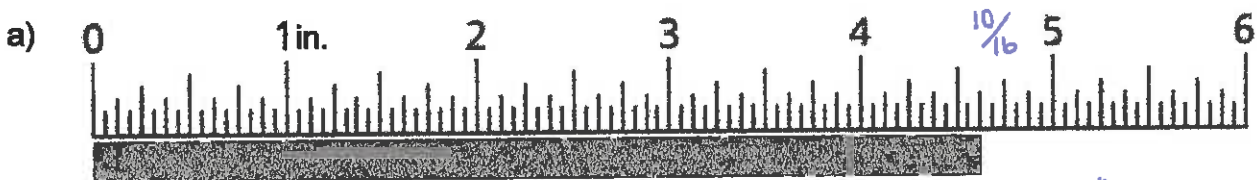
C precision

B. how close a measured value is to the true value

A uncertainty

C. the smallest unit of measurement on the measuring device being used

2. For each image, state the precision of the measuring device and determine the length of the item, including its uncertainty.



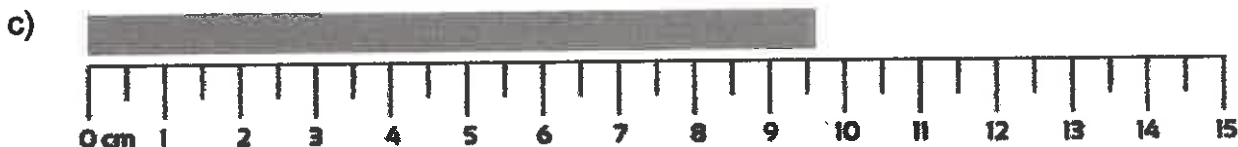
precision: $\frac{1}{16}$ "

length: $4\frac{5}{8}$ " \pm $\frac{1}{32}$ "



precision: 1 mm
(0.1 cm)

length: 48 mm \pm 0.5 mm
(4.8 cm \pm 0.05 cm)



precision: 0.5 cm
(5 mm)

length: 9.5 cm \pm 0.25 cm
(95 mm \pm 2.5 mm)

3. Indy is measuring the span of a coupling. The coupling has an actual length of 48.302 mm. Write the measurement Indy would record, including the measurement uncertainty, if he measured the coupling with the following tools.

measure to nearest cm
measure to nearest mm
measure to nearest 0.2 mm

- a) A meter stick marked in centimeters $\pm 0.5 \text{ cm}$
 $\underline{5 \text{ cm} \pm 0.5 \text{ cm}}$
- b) A tape measure marked in millimeters $\pm 0.5 \text{ mm}$
 $\underline{48 \text{ mm} \pm 0.5 \text{ mm}}$
- c) A digital caliper with precision of 0.02 mm $\pm 0.01 \text{ mm}$
 $\underline{48.30 \text{ mm} \pm 0.01 \text{ mm}}$

4. Jacob went fishing and caught three salmon. He weighed the fish on a scale, and found them to weigh 9.3 kg, 4.7 kg, and 8.4 kg.

- a) What is the precision of the scale? $\underline{0.1 \text{ kg}}$
- b) What is the uncertainty for each of the fish weights? $\underline{\pm 0.05 \text{ kg}}$
- c) What is the combined weight of the three fish, including uncertainty?
 $\begin{array}{r} 9.3 \pm 0.05 \\ 4.7 \pm 0.05 \\ 8.4 \pm 0.05 \\ \hline 22.4 \pm 0.15 \end{array}$ $\underline{22.4 \text{ kg} \pm 0.15 \text{ kg}}$
- d) What is the maximum combined weight of the three fish? $\underline{22.55 \text{ kg}}$
- e) What is the minimum combined weight of the three fish? $\underline{22.25 \text{ kg}}$

5. Mary is cutting carpet to be installed in a hallway. She has a piece of carpet that is 18 ft $9\frac{7}{8}$ in. long and she needs to cut off a piece that is $6\frac{1}{4}$ in. long. If she uses the tape measure shown to make her measurements, what is length, including uncertainty, of the remaining length of carpet?



$P: \frac{1}{8}''$
 $u: \pm \frac{1}{16}''$

$18 \text{ ft } 9\frac{7}{8} \text{ in} \pm \frac{1}{16} \text{ in}$
 $- 6\frac{2}{8} \text{ in} \pm \frac{1}{16} \text{ in}$

 $18 \text{ ft } 3\frac{5}{8} \text{ in} \pm \frac{2}{16} \text{ in}$
 $\downarrow \frac{1}{8} \text{ in.}$