Math 8 Unit 1 worksheet: Significant figures

Name _____ Date _____ Period _____

1. Give the number of significant figures in each reading. Where the written number allows more than one count, list them all.

(a) $3.040\ \text{m}$ (b) $0.0905\ \text{g}$ (c) $7.10 \times 10^{-3}\ \text{kg}$ (d) $508\ \text{mL}$

(e) $0.30\ \text{s}$ (f) $40{,}500\ \text{km}$ (g) $1.0060\ \text{L}$ (h) $8.0 \times 10^{2}\ \text{m}$

2. Round each number to the number of significant figures in parentheses. Use scientific notation when zeros at the end of a whole number would be ambiguous.

(a) 8.4362 (3) (b) 0.0059971 (2) (c) $395{,}210$ (2)

(d) 19.96 (3) (e) 0.80455 (4) (f) 2.9998×10^{7} (3)

3. Each reading below was written with exactly the digits its tool supported. Give the size of the tool's smallest step, with its unit.

(a) $6.30\ \text{g}$ (b) $3.05 \times 10^{-2}\ \text{s}$ (c) $4.0 \times 10^{3}\ \text{m}$ (d) $0.250\ \text{L}$ (e) $7.200 \times 10^{1}\ \text{km}$

4. A school roof holds 24 identical solar panels. One panel was measured as $1.65\ \text{m}$ by $0.992\ \text{m}$.

(a) Find the total area of the 24 panels to an honest number of significant figures.

(b) Diego first rounds the area of one panel to three significant figures and then multiplies by 24. What does he report, and why does his answer differ from yours?

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5. Owen writes the height of a bookshelf as 1.2 m. Layla measures the same shelf and writes 1.20 m. Owen says the two records are the same, because 1.2 = 1.20.

(a) Give the smallest and largest true heights each record allows.

(b) Do the two records say the same thing? Explain.

6. Each pair records one measurement in two units. Give the number of significant figures in each record (every possibility if a number cannot say), and decide whether the two records claim the same precision. If they do not, rewrite the second record in scientific notation so that it matches the first.

(a) 0.0360 kg and 36.0 g

(b) 2.50 m and 250 cm

(c) 0.40 L and 4.0×10^2 mL

(d) 1.500 km and 1.5×10^3 m

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7. Hannah packs a suitcase for a trip. The empty suitcase weighs 4.6 kg on a bathroom scale that reads tenths of a kilogram. A camera bag weighs 1.375 kg on a postal scale that reads to the gram, and a pair of boots weighs 0.88 kg on a scale that reads hundredths of a kilogram. Find the mass of the packed suitcase, reported honestly.

8. A metal tin holding 200 identical coins weighs 1.164 kg on a kitchen scale that reads to the gram. The empty tin weighs 0.312 kg on the same scale. Find the mass of one coin in grams, to an honest number of significant figures.

9. Kevin measures a poster with a meter stick marked in millimeters: 61.0 cm by 45.7 cm. He reports its area as 2787.7 cm^2. Explain what is wrong with his report, and write the area so that a reader can tell exactly how many significant figures it has.

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