

NAME: _____

A.M.3: Calculate the relative error in measuring square and cubic units, when there is an error in the linear measure.

1. fall0723ia, P.I. A.M.3

The groundskeeper is replacing the turf on a football field. His measurements of the field are 130 yards by 60 yards. The actual measurements are 120 yards by 54 yards. Which expression represents the relative error in the measurement?

[A] $\frac{(130)(60) - (120)(54)}{(120)(54)}$

[B] $\frac{(120)(54)}{(130)(60) - (120)(54)}$

[C] $\frac{(130)(60)}{(130)(60) - (120)(54)}$

[D] $\frac{(130)(60) - (120)(54)}{(130)(60)}$

2. 080828ia, P.I. A.M.3

Ryan estimates the measurement of the volume of a popcorn container to be 282 cubic inches. The actual volume of the popcorn container is 289 cubic inches. What is the relative error of Ryan's measurement to the *nearest thousandth*?

[A] 1.025 [B] 0.025

[C] 0.024 [D] 0.096

3. 060928ia, P.I. A.M.3

To calculate the volume of a small wooden cube, Ezra measured an edge of the cube as 2 cm. The actual length of the edge of Ezra's cube is 2.1 cm. What is the relative error in his volume calculation to the *nearest hundredth*?

[A] 0.14 [B] 0.16 [C] 0.13 [D] 0.15

4. 080926ia, P.I. A.M.3

Carrie bought new carpet for her living room. She calculated the area of the living room to be 174.2 square feet. The actual area was 149.6 square feet. What is the relative error of the area to the *nearest ten-thousandth*?

[A] 0.1412 [B] 0.1644

[C] 2.1644 [D] 1.8588

5. 010934ia, P.I. A.M.3

Sarah measures her rectangular bedroom window for a new shade. Her measurements are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Using the measurements that Sarah took, determine the number of square inches in the area of the window. Determine the number of square inches in the actual area of the window. Determine the relative error in calculating the area. Express your answer as a decimal to the *nearest thousandth*.

6. 060838ia, P.I. A.M.3

Sophie measured a piece of paper to be 21.7 cm by 28.5 cm. The piece of paper is actually 21.6 cm by 28.4 cm. Determine the number of square centimeters in the area of the piece of paper using Sophie's measurements. Determine the number of square centimeters in the actual area of the piece of paper. Determine the relative error in calculating the area. Express your answer as a decimal to the *nearest thousandth*. Sophie does not think there is a significant amount of error. Do you agree or disagree? Justify your answer.

A.M.3: Calculate the relative error in measuring square and cubic units, when there is an error in the linear measure.

[1] A

[2] C

[3] A

[4] B

[3] 1,512 and 1,551.25 and 0.025, and appropriate work is shown.

[2] Appropriate work is shown, but one computational or rounding error is made.

[1] Appropriate work is shown, but two or more computational or rounding errors are made.

or [1] Appropriate work is shown, but one conceptual error is made, such as dividing by 1,512.

or [1] Appropriate work is shown to find 1,512 and 1,551.25, but no further correct work is shown.

or [1] 1,512 and 1,551.25 and 0.025, but no work is shown.

[0] 1,512 or 1,551.25 or 0.025, but no work is shown.

or (0) A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[5] obviously incorrect procedure.

[4] 618.45, 613.44, and 0.008, and appropriate work is shown, and an appropriate justification is given.

[3] Appropriate work is shown, but one computational or rounding error is made.

or [3] 618.45, 613.44, and 0.008, and appropriate work is shown, but no justification is given.

[2] Appropriate work is shown, but two or more computational or rounding errors are made.

or [2] Appropriate work is shown, but one conceptual error is made, such as dividing by 618.45.

[1] Appropriate work is shown, but one conceptual error and one computational or rounding error are made.

or [1] 618.45 and 613.44, and appropriate work is shown, but no further correct work is shown.

or [1] 618.45, 613.44, and 0.008, but no work is shown.

[0] 618.45 or 613.44, and appropriate work is shown, but no further correct work is shown.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[6] obviously incorrect procedure.