Physics 1 Unit 1 – 1D Kinematics and Error Analysis Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Extra Error propagation exercises

Solve each of the following problems. Include the uncertainty present in your answer by performing proper error propagation.

1. Dick and Jane are acrobats. Dick is 186 +/- 2 cm tall, and Jane is 147 +/- 3 cm tall. If Jane stands on top of Dick's head, how far is her head above the ground?
2. Jane needs to calculate the volume of her pool, so that she knows how much water she'll need to fill it. She measures the length, width, and height:

L = 5.56 ± 0.14 m W = 3.12 ± 0.08 m D = 2.94 ± 0.11 m

1. Fred also needs to calculate the volume of his pool which is a perfect cube. He measures the length of one side to be L = 1.80 ± 0.25 m
2. w = (4.52 ± 0.02) cm, x = (2.0 ± 0.2) cm, y = (3.0 ± 0.6) cm. Find z = x + y - w and its uncertainty.
3. The radius of a circle is x = (3.0 ± 0.2) cm. Find the circumference and its uncertainty.
4. w = (4.52 ± 0.02) cm, x = (2.0 ± 0.2) cm.  Find z = w x and its uncertainty.
5. x = ( 2.0 ± 0.2) cm, y = (3.0 ± 0.6) sec Find z = x/y.
6. w = (4.52 ± 0.02) cm, A = (2.0 ± 0.2) cm2, y = (3.0 ± 0.6) cm. Find
7. w = (4.52 ± 0.02) cm, x = (2.0 ± 0.2) cm, y = (3.0 ± 0.6) cm. Find z = w x +y2
8. A car was moving at a constant speed of 25 ± 3 m/s when it passed Ellie’s house. 352± 5 seconds later it began to slowed down to stop before Fawn’s house. It was slowing for about 34 ± 3 m. How far is it from Ellie’s house to Fawn’s house?

(Use Distance = speed \* time + Stopping distance)