

WA1 Answer Key

Monday, August 19, 2019 11:35 AM

1. Question Details

The speed limit on some interstate highways is roughly 130 km/h.

(a) What is this in meters per second?

36.1 m/s

(b) How many miles per hour is this?

80.8 mi/h

$$\frac{130 \text{ km}}{\text{hr}} \times \frac{1 \text{ hr}}{60 \text{ min}} \times \frac{1 \text{ min}}{60 \text{ s}} \times \frac{1000 \text{ m}}{1 \text{ km}} = 36.1 \text{ m/s}$$

$$\frac{130 \text{ km}}{\text{hr}} \times \frac{1 \text{ mi}}{1.6 \text{ km}} = 81.25 \text{ mi/hr}$$

2. Question Details

A car is traveling at a speed of 28 m/s.

(a) What is its speed in kilometers per hour?

101 km/h

(b) Is it exceeding the 80 km/h speed limit?

☒ Yes

☐ No

$$\frac{28 \text{ m}}{\text{s}} \times \frac{1 \text{ km}}{1000 \text{ m}} \times \frac{3600 \text{ s}}{1 \text{ hr}} = 100.8 \text{ km/hr}$$

3. Question Details

OSColPhysAP2016 1.2.P.004 [3604418]

American football is played on a 100 yd long field, excluding the end zones. How long is the field in meters? (Assume that 1 meter equals 3.281 feet.)

91.4 m

$$100 \text{ yd} \times \frac{3 \text{ feet}}{1 \text{ yd}} \times \frac{1 \text{ m}}{3.281 \text{ ft}} = 91.43 \text{ m}$$

4. Question Details

OSColPhysAP2016 1.2.P.006 [3604328]

What is the height in meters of a person who is 4 ft 4.0 in. tall? (Assume that 1 meter equals 39.37 in.)

1.32 m

$$4' 4'' \text{ is } 4 \frac{1}{3} \text{ feet, not } 4.4 \text{ feet}$$

$$4.33 \text{ feet} \times \frac{1 \text{ m}}{3.281 \text{ ft}} = 1.32 \text{ m}$$

5. Question Details

OSColPhysAP2016 1.2.P.007 [3604197]

Mount Everest, at 29028 feet, is the tallest mountain on the Earth. What is its height in kilometers? (Assume that 1 kilometer equals 3,281 feet.)

8.85 km

$$29028 \text{ ft} \times \frac{1 \text{ m}}{3281 \text{ ft}} \times \frac{1 \text{ km}}{1000 \text{ m}} = 8.85 \text{ km}$$

6. Question Details

OSColPhysAP2016 1.3.P.022 [3604348]

What is the area of a circle 3.866 cm in diameter? (Express your answer to the correct number of significant figures and proper units.)

Value 11.7506749314105 cm²

$$A = \pi r^2 = \frac{3.866 \text{ cm}}{2} = 1.934 \text{ cm radius}$$

$$A = \pi (1.934)^2 = 11.75 \text{ cm}^2$$

7. Question Details

OSColPhysAP2016 1.3.WA.009 [3569824]

An infant's pulse rate is measured to be 121 ± 4 beats per minute. What is the percent uncertainty in this measurement? (Note that percent uncertainties should be reported to two significant figures.)

3.31 %

$$\% \text{ uncertainty} = \frac{\text{range}}{\text{value}} = \frac{4}{121} = 0.033 = 3.3\%$$

8. Question Details

State the number of significant figures in each of the following.

(a) 40 (This is a measurement rather than a count.)

1

(b) 1.4×10^4

2

(c) 1.40×10^4

3

(d) 4.01×10^4

3

(e) 4.010×10^4

4

(f) 0.0014

2

(g) 0.041

2

(h) 0.0104

3

9. Question Details

OSCoIPhysAP2015 1.3.WA.018. [3569911]

Below is the calculator result for the operation indicated. Enter the answer to the correct number of significant figures for this calculation, using the rules for significant figures.

$$\frac{157.847}{2.541817} = 62.1000646367997$$

62.1

use the same # of sig figs
as given in the question.

This is a dumb question, but raises
the point on how many sig figs to use.

"No calculator diarrhea"