

Name:

Intro Physics  
Converting Measures of Length and Time  
Step by Step

Date:

$$\begin{aligned} 1 \text{ m} &= 100 \text{ cm} \\ 1 \text{ m} &= 1000 \text{ mm} \\ 1 \text{ km} &= 1000 \text{ m} \\ 1 \text{ mile} &= 1609 \text{ m} \\ 1 \text{ inch} &= 25.4 \text{ mm} \end{aligned}$$

$$\begin{aligned} 1 \text{ hour} &= 60 \text{ min} \\ 1 \text{ min} &= 60 \text{ sec} \\ 1 \text{ day} &= 24 \text{ hours} \\ 1 \text{ average month} &= 30.42 \text{ days} \\ 1 \text{ year} &= 365.2422 \text{ days} \end{aligned}$$

Convert the following quantities, showing proper factor conversions:

**Problems 1-4:** What is the proper unit for each answer?

1. 5.89 m → ??

$$5.89 \text{ m} \left( \frac{100 \text{ cm}}{1 \text{ m}} \right) = 589 \text{ \_\_\_\_\_\_}$$

2. 1 day → ??

$$1 \text{ day} \left( \frac{24 \text{ h}}{1 \text{ day}} \right) = 24 \text{ \_\_\_\_\_\_}$$

3. 12 inches → ??

$$12 \text{ inches} \left( \frac{25.4 \text{ mm}}{1 \text{ inch}} \right) \left( \frac{1 \text{ cm}}{10 \text{ mm}} \right) = 30.48 \text{ \_\_\_\_\_\_}$$

4. 1 year → ??

$$1 \text{ year} \left( \frac{365 \text{ days}}{1 \text{ year}} \right) \left( \frac{24 \text{ h}}{1 \text{ day}} \right) \left( \frac{60 \text{ min}}{1 \text{ h}} \right) = 525,600 \text{ \_\_\_\_\_\_}$$

**Problems 5-8:** Fill in the proper number *and* unit for the answer.

5. 100 mm → cm

$$100 \text{ mm} \left( \frac{1 \text{ cm}}{10 \text{ mm}} \right) = \text{\_\_\_\_\_\_}$$

6. 1000. s → hours

$$1000 \text{ s} \left( \frac{1 \text{ min}}{60 \text{ s}} \right) \left( \frac{1 \text{ h}}{60 \text{ min}} \right) = \text{\_\_\_\_\_\_}$$

7. 2.67 cm → km

$$2.67 \text{ cm} \left( \frac{1 \text{ m}}{100 \text{ cm}} \right) \left( \frac{1 \text{ km}}{1000 \text{ m}} \right) = \text{\_\_\_\_\_\_}$$

8. 24 min → hours

$$24 \text{ min} \left( \frac{1 \text{ h}}{60 \text{ min}} \right) = \text{\_\_\_\_\_\_}$$

**Problems 9-12:** Fill in the missing part(s) of the ratio(s), *and* the proper number *and* unit for the answer.

9. 20. mm → m

$$20 \text{ mm} \left( \frac{\text{\_\_\_\_\_\_}}{1000 \text{ mm}} \right) = \text{\_\_\_\_\_\_}$$

10. 1 s → hours

$$1 \text{ s} \left( \frac{1 \text{ min}}{60 \text{ s}} \right) \left( \frac{1 \text{ h}}{\text{\_\_\_\_\_\_}} \right) = \text{\_\_\_\_\_\_}$$

11. 5.567.8 km → m

$$5,567.8 \text{ km} \left( \frac{\text{\_\_\_\_\_\_}}{\text{km}} \right) = \text{\_\_\_\_\_\_}$$

12. 1 year → s

$$1 \text{ year} \left( \frac{\text{\_\_\_\_\_\_}}{1 \text{ year}} \right) \left( \frac{\text{\_\_\_\_\_\_}}{\text{day}} \right) \left( \frac{\text{\_\_\_\_\_\_}}{\text{\_\_\_\_\_\_}} \right) \left( \frac{\text{\_\_\_\_\_\_}}{\text{\_\_\_\_\_\_}} \right) = \text{\_\_\_\_\_\_}$$

**Problems 13-16:** Fill in the ratio(s), *and* the proper number *and* unit for the answer.

13. 100. miles → m

$$100 \text{ miles} \left( \frac{\quad}{\quad} \right) = \underline{\hspace{2cm}}$$

14. 12.67 min → s

$$12.67 \text{ min} \left( \frac{\quad}{\quad} \right) = \underline{\hspace{2cm}}$$

15. 1 yard → m

$$1 \text{ yard} \left( \frac{\quad}{\quad} \right) \left( \frac{\quad}{\quad} \right) \left( \frac{\quad}{\quad} \right) = \underline{\hspace{2cm}}$$

16. 1 month → hours

$$1 \text{ month} \left( \frac{\quad}{\quad} \right) \left( \frac{\quad}{\quad} \right) = \underline{\hspace{2cm}}$$

**Problems 17-20:** Show all the work.

17. 200 miles → km

18. 392. s → min

19. 5 feet, 10 inches → m

20. One long block → days