

Unit 4 Practice Test Solutions

1) $\sqrt[5]{243}$

$$\begin{array}{r} 3 \ 81 \\ 3 \ 27 \\ 3 \ 9 \\ 3 \ 3 \end{array}$$

$\sqrt[5]{3 \cdot 3 \cdot 3 \cdot 3 \cdot 3}$

$$\boxed{3}$$

2) $\sqrt[4]{\frac{256}{625}}$

$$\sqrt[4]{\frac{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2}{5 \cdot 5 \cdot 5 \cdot 5}}$$

$$\frac{2 \cdot 2}{5} = \boxed{\frac{4}{5}}$$

$$\begin{array}{r} 256 \\ 2 \ 128 \\ 2 \ 64 \\ 2 \ 32 \\ 2 \ 16 \\ 2 \ 8 \\ 2 \ 4 \\ 2 \ 2 \end{array}$$

$$\begin{array}{r} 625 \\ 5 \ 125 \\ 5 \ 25 \\ 5 \ 5 \end{array}$$

3)

$$\boxed{60 \text{ cm}^2}$$

$A = l \times w$
 $= s^2$

$$\boxed{7.7 \text{ or } 7.8 \text{ cm}}$$

$$s^2 = 60 \text{ cm}^2$$

$$s = \sqrt{60}$$

$$\sqrt{49}$$

$$\downarrow$$

$$7$$

$$\sqrt{60} \quad \sqrt{64}$$

$$\downarrow$$

$$8$$

$$\begin{array}{r} 7.7 \\ 7.7 \\ \hline 39 \\ 5390 \\ \hline 59.29 \end{array}$$

$$\begin{array}{r} 7.8 \\ 7.8 \\ \hline 624 \\ 5460 \\ \hline 60.84 \end{array}$$

4)

$$\sqrt[4]{220}$$

=>

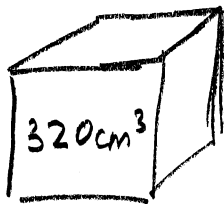
It would lie between
3 and 4

$$2^4 = 16$$

$$3^4 = 81$$

$$4^4 = 256 \text{ or } \sqrt[4]{220} \approx 3.851$$

5)



$$\sqrt[3]{320}$$

$$2 \quad 160$$

$$2 \quad 80$$

$$2 \quad 40$$

$$2 \quad 20$$

$$5 \quad 4$$

$$2 \quad 2$$

$$\sqrt[3]{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 5}$$

$$2 \cdot 2 \sqrt[3]{5}$$

$$4 \sqrt[3]{5}$$

6)

$$5 \sqrt[3]{25} = \sqrt[3]{25 \cdot 5 \cdot 5 \cdot 5} = \sqrt[3]{3125}$$

$$6 \sqrt[3]{18} = \sqrt[3]{18 \cdot 6 \cdot 6 \cdot 6} = \sqrt[3]{3888}$$

$$7 \sqrt[3]{10} = \sqrt[3]{10 \cdot 7 \cdot 7 \cdot 7} = \sqrt[3]{3430}$$

$$4 \sqrt[3]{30} = \sqrt[3]{30 \cdot 4 \cdot 4 \cdot 4} = \sqrt[3]{1920}$$

$$3 \sqrt[3]{35} = \sqrt[3]{35 \cdot 3 \cdot 3 \cdot 3} = \sqrt[3]{945}$$

$$\sqrt[3]{35}, \sqrt[3]{30}, \sqrt[3]{25}, \sqrt[3]{10}, \sqrt[3]{18}$$

$$7) \quad (-125)^{2/3} \Rightarrow \sqrt[3]{(-125)^2}$$

$$\begin{array}{r} -5 \cdot 25 \\ -5 \cdot 5 \end{array}$$

$$\sqrt[3]{(-5)(-5)(-5)^2}$$

$$(-5)^2 \Rightarrow \boxed{25}$$

$$8) \quad \left(\frac{81}{625}\right)^{-2/4} \Rightarrow \left(\frac{625}{81}\right)^{2/4} \Rightarrow \sqrt[4]{\left(\frac{625}{81}\right)^2}$$

$$\begin{array}{r} 625 \\ 5 \cdot 125 \\ 5 \cdot 25 \\ 5 \cdot 5 \end{array} \quad \begin{array}{r} 81 \\ 3 \cdot 27 \\ 3 \cdot 9 \\ 3 \cdot 3 \end{array}$$

$$\sqrt[4]{\left(\frac{5 \cdot 5 \cdot 5 \cdot 5}{3 \cdot 3 \cdot 3 \cdot 3}\right)^2}$$

$$\Rightarrow \left(\frac{5}{3}\right)^2 = \boxed{\frac{25}{9}}$$

$$9) \quad h = 35d^{2/3} \quad d = 4.1 \text{ m}$$

$$= 35(4.1)^{2/3}$$

$$= 35(\sqrt[3]{4.1^2})$$

$$= 35(2.56) \leftarrow \text{careful with rounding at this step.}$$

$$\approx 89.66 \text{ m.}$$

The tree will be about
89.66 m tall

$$10) (-6)^{-4} \rightarrow \frac{1}{(-6)^4} \rightarrow \boxed{\frac{1}{1296}}$$

$$\begin{array}{r} -6 \times -6 \times -6 \times -6 \\ \hline 36 \times 36 \\ \hline 1296 \end{array}$$

$$\begin{array}{r} 36 \\ 36 \\ \hline 216 \\ 1080 \\ \hline 1296 \end{array}$$

11)

$$v = 0.155 s^{5/3} f^{-7/6}$$

$$s = 1 \quad f = 0.5$$

$$= 0.155 (1)^{5/3} (0.5)^{-7/6}$$

$$0.5 = \frac{1}{2}$$

$$= 0.155 (1)^{5/3} \left(\frac{1}{2}\right)^{-7/6}$$

$$= 0.155 (1)^{5/3} (2)^{7/6}$$

$$= 0.155 (\sqrt[3]{1^5}) (\sqrt[6]{2^7})$$

$$= 0.155 (1) (\sqrt[6]{2^7})$$

$$= 0.155 (2.245) \leftarrow \text{Careful with rounding at this step}$$

$$\approx 0.348 \text{ m/s}$$

The dinosaur moves at about 0.348 m/s

12)

$$\frac{-4a^{-4}b^5c^2}{16a^9b^2c^{-5}}$$

$$\frac{-4}{16} \cdot \frac{a^{-4}}{a^9} \cdot \frac{b^5}{b^2} \cdot \frac{c^2}{c^{-5}}$$

$$-\frac{1}{4} \cdot a^{-4-9} \cdot b^{5-2} \cdot c^{2-(-5)}$$

$$= \frac{1}{4} \cdot a^{-13} b^3 c^3$$

=>

$$\boxed{-\frac{b^3 c^3}{4a^{13}}}$$

13)

$$\left(\frac{125a^9b^{-5}}{8a^3b^4}\right)^{-\frac{2}{3}}$$

$$\left(\frac{125}{8} \cdot \frac{a^9}{a^3} \cdot \frac{b^{-5}}{b^4}\right)^{-\frac{2}{3}}$$

$$\left(\frac{125}{8} \cdot a^{9-3} \cdot b^{-5-4}\right)^{-\frac{2}{3}}$$

$$\left(\frac{125}{8} a^6 b^{-9}\right)^{-\frac{2}{3}}$$

$$\left(\frac{125a^6}{8b^9}\right)^{-\frac{2}{3}}$$

$$\left(\frac{8b^9}{125a^6}\right)^{\frac{2}{3}}$$

$$\left(\frac{8}{125}\right)^{\frac{2}{3}} \cdot b^{9 \times \frac{2}{3}} \cdot \frac{1}{a^{6 \times \frac{2}{3}}}$$

$$\sqrt[3]{\left(\frac{8}{125}\right)^2} \cdot b^6 \cdot \frac{1}{a^4}$$

$$\left(\frac{2}{5}\right)^2 \cdot \frac{b^6}{a^4}$$

$$\boxed{\frac{4b^6}{25a^4}}$$

$$14) \quad (\sqrt[9]{4}) (\sqrt[3]{4^4})$$

$$(4^{\frac{1}{9}}) (4^{\frac{3}{4}})$$

$$(4^{\frac{4}{36}}) (4^{\frac{27}{36}})$$

$$(4^{\frac{4}{36} + \frac{27}{36}})$$

$$\boxed{4^{\frac{31}{36}}}$$