

Homework 1 Solutions

1. Simplify

(a) $10^0 = \boxed{1}$

(b) $13^1 = \boxed{13}$

(c) $12^{-2} = \frac{1}{12^2} = \boxed{\frac{1}{144}}$

(d) $(2x)^3 = 2^3x^3 = \boxed{8x^3}$

(e) $\left(\frac{8}{12}\right)^2 = \frac{64}{144} = \frac{32}{72} = \frac{16}{36} = \frac{8}{18} = \boxed{\frac{4}{9}}$

(f) $(3^2)^3 = 3^6 = \boxed{729}$

(g) $0^{10} = \boxed{0}$

(h) $(-9)^2 = \boxed{81}$

(i) $(-9)^3 = \boxed{-729}$

(j) Write as a radical: $14^{4/7} = \boxed{\sqrt[7]{14^4}}$

2. Simplify. State "DNE" if answer does not exist.

(a) $\sqrt{100} = \boxed{10}$

(b) $\sqrt[3]{64} = \boxed{4}$

(c) $\sqrt[3]{-64} = \boxed{-4}$

(d) $\sqrt{-100} = \boxed{DNE}$

(e) $\sqrt{9x^4} = \sqrt{9}\sqrt{x^4} = \boxed{3x^2}$

(f) $\sqrt{\frac{y^3}{12}} = \frac{\sqrt{y^3}}{\sqrt{12}} = \boxed{\frac{y\sqrt{y}}{2\sqrt{3}}}$

(g) Write as an exponent: $\sqrt[5]{13^2} = \boxed{13^{\frac{2}{5}}}$

3. Simplify:

$$\left(\frac{7y^{-2}t^{-4}}{11y^3t^{-12}}\right)^3$$

$$= \frac{7^3y^{-6}t^{-12}}{11^3y^9t^{-36}} \quad (1)$$

$$= \frac{343t^{36}}{1331y^9y^6t^{12}} \quad (2)$$

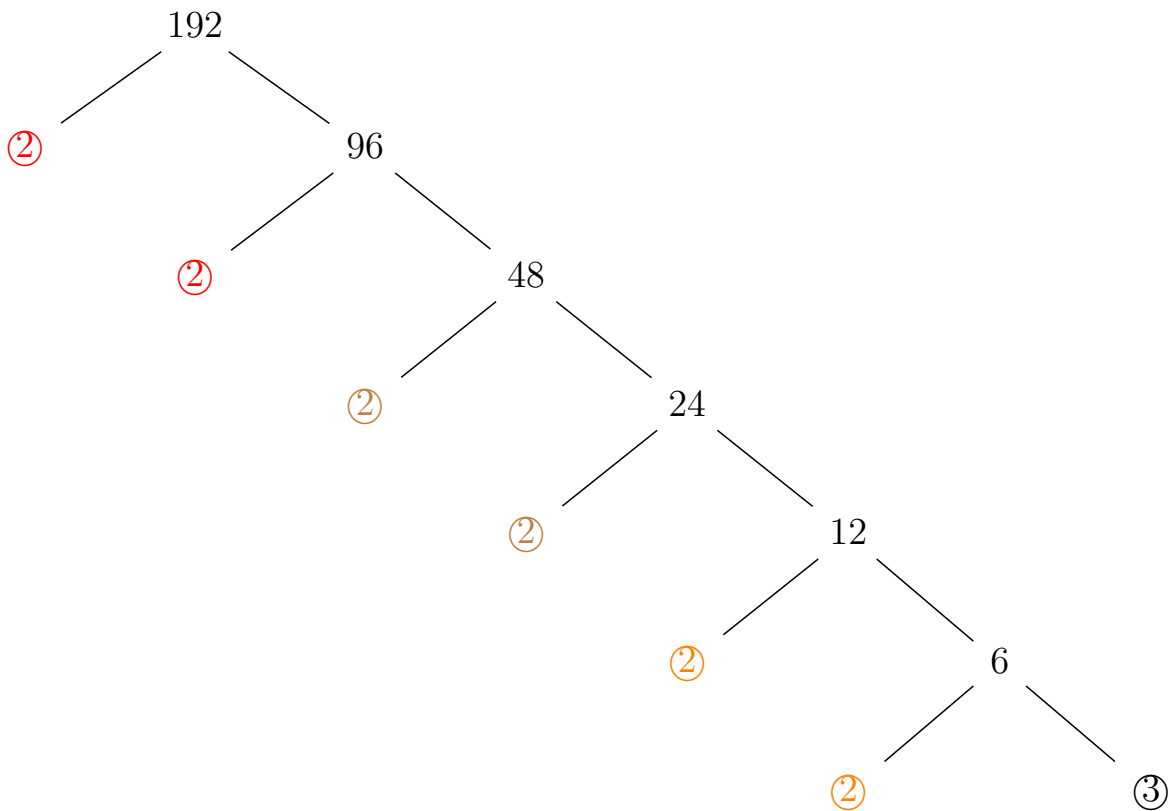
$$= \boxed{\frac{343t^{24}}{1331y^{15}}} \quad (3)$$

4. Simplify:

$$5\sqrt{12} + 3\sqrt{3}$$

$$\begin{aligned}
&= 5(2\sqrt{3}) + 3\sqrt{3} \\
&= 10\sqrt{3} + 3\sqrt{3} \\
&= \boxed{13\sqrt{3}}
\end{aligned}$$

5. Draw a factor tree for 192. Make the appropriate circles and boxes for $\sqrt{192}$. What is $\sqrt{192}$?



Same color indicates same box. If the number is black it is not in a box. I take one "2" from each of the three boxes and get: $2^3\sqrt{3} = \boxed{8\sqrt{3}}$.

6. Simplify:

$$\begin{aligned}
&\sqrt[5]{x^3} \cdot \sqrt[10]{x^7} \\
&= x^{3/5} \cdot x^{7/10} \\
&= x^{\frac{3}{5} + \frac{7}{10}} \\
&= x^{\frac{6}{10} + \frac{7}{10}} \\
&= \boxed{x^{13/10}} \\
&= \text{ or } \boxed{\sqrt[10]{x^{13}}}
\end{aligned}$$