Chapter 4 Review

4.4 **1.** Write each power as a radical.

a) $13^{\frac{1}{2}} =$ _____ **b)** $(-2)^{\frac{1}{3}} =$ _____ **c)** $15^{\frac{1}{4}} =$ _____

2. Evaluate each power.

a) $25^{\frac{1}{2}} =$ _____ **b)** $(-1000)^{\frac{1}{3}} =$ _____ **c)** $1^{\frac{1}{4}} =$ _____

3. This formula is used to estimate the thickness of ice, t millimetres, needed to support a mass, m kilograms, safely: $t = 3.8\, m^{\frac{1}{2}}$

To the nearest millimetre, estimate the thickness of ice needed to support each mass.

a) a person with a mass of 75 kg

The thickness is about: _____

b) a car with a mass of 800 kg

The thickness is about: _____

4. Write each radical as a power with a fractional exponent.

a) $\sqrt{5^3} =$ _____ **b)** $\left(\sqrt{27}\right)^5 =$ _____

c) $\sqrt[3]{25^4} =$ _____ **d)** $\left(\sqrt[4]{11}\right)^3 =$ _____

5. Evaluate each expression.

a) $\left(\sqrt[3]{-8}\right)^2 =$ _____ **b)** $\sqrt{4^3} =$ _____

c) $(-64)^{\frac{2}{3}} =$ _____ **d)** $81^{\frac{5}{4}} =$ _____

4.4 **10.** Evaluate each power.

a) $36^{\frac{1}{2}} =$ _____ **b)** $125^{\frac{1}{3}} =$ _____ **c)** $81^{\frac{3}{4}} =$ _____

11. a) Write each radical as a power.

i) $\sqrt[5]{18^2}$: _____ **ii)** $\left(\sqrt[4]{21}\right)^3$: _____

b) Write each power as a radical.

i) $25^{\frac{4}{3}}$: _____ **ii)** $75^{\frac{2}{5}}$: _____

4.5 **6.** Write each power with a positive exponent.

a) $7^{-3} =$ _____ **b)** $\frac{1}{2^{-3}} =$ _____

c) $5^{-\frac{3}{2}} =$ _____ **d)** $\left(\frac{4}{9}\right)^{-5} =$ _____

7. Evaluate each power.

a) $36^{-\frac{1}{2}} =$ **b)** $8^{-\frac{1}{3}} =$

c) $27^{-\frac{2}{3}} =$

4.5 **12.** Write each power with a positive exponent.

a) $8^{-5} =$ _____ **b)** $6^{-\frac{2}{3}} =$ _____ **c)** $\frac{1}{3^{-10}} =$ _____ **d)** $\left(\frac{9}{2}\right)^{-3} =$ _____

13. Evaluate each power.

a) $3^{-3} =$ _____ **b)** $\left(\frac{3}{10}\right)^{-3} =$ _____ **c)** $4^{-\frac{3}{2}} =$ _____

4.6 **14.** Evaluate.

a) $(3^{-2})^{-2} =$ **b)** $\left(4^{\frac{1}{2}} \cdot 4^{\frac{3}{2}}\right)^{-1} =$

15. Simplify. Write an expression with a positive exponent where necessary.

a) $x^{\frac{2}{3}} \cdot x^{-2} =$ **b)** $\frac{18x^{\frac{1}{2}}}{24x^{-\frac{3}{2}}} =$

1. Write as a power with a positive exponent.

a) $5^7 \cdot 5^4 \cdot 5^{-7} =$ **b)** $\frac{11^2}{11^{-3}} =$

c) $(3^2 \cdot 3^2)^{-2} =$ **d)** $\left(\frac{8^2}{8^3}\right)^{-4} =$

2. Evaluate.

a) $(7^{-2})^{-1} =$

b) $5^3 \cdot (5^{-2})^2 =$

c) $\left(\dfrac{4^{-3} \cdot 4^{-1}}{4^{-2}}\right)^2 =$

Each answer should be an integer or a fraction.

3. Write as a power with a positive exponent.

a) $5^{\frac{3}{4}} \cdot 5^{-\frac{1}{4}} =$

b) $(7^{-0.5} \cdot 7^{2.5})^{-2} =$

c) $\dfrac{3^{-\frac{2}{3}}}{3^{\frac{4}{3}}} =$

d) $\left(\dfrac{2^{-1.75}}{2^{-0.25}}\right)^3 =$