

ANSWERS → Exercise 6

1.  $6^{1/2} = \sqrt{6}$     2.  $(-14)^{3/5} = (\sqrt[5]{-14})^3$

3.  $-8^{5/2} = -(\sqrt{8})^5$     4.  $(\frac{8}{9})^{8/3} = (\sqrt[3]{\frac{8}{9}})^8$

5.  $(\frac{2}{3})^{2/x} = (\sqrt[x]{\frac{2}{3}})^2$     6.  $x^{m/3} = (\sqrt[3]{x})^m$

7.  $(x^{-1})^{m/n} = (\frac{1}{x})^{m/n} = (\sqrt[n]{\frac{1}{x}})^m$

$$8. \left(\frac{1}{x}\right)^{1/3} = \sqrt[3]{\frac{1}{x}}$$

$$9. \sqrt{13} = 13^{1/2} \quad 10. \sqrt[4]{17} = 17^{1/4} \quad 11. (\sqrt[7]{5})^4 = 5^{4/7}$$

$$12. \frac{1}{\sqrt{5}} = \frac{1}{5^{1/2}} \quad 13. \left(\frac{1}{\sqrt[10]{11}}\right)^{17} = \frac{1}{11^{17/10}}$$

$$14. \frac{1}{\sqrt[3]{2^{-n}}} = \frac{1}{2^{-n/3}} = 2^{n/3}$$

$$15. \sqrt[3]{y^{-5}} = y^{-5/3} = \frac{1}{y^{5/3}}$$

$$16. 16^{1/2} = \sqrt{16} = 4$$

$$17. \left(\frac{1}{9}\right)^{1/2} = \sqrt{\frac{1}{9}} = \frac{\sqrt{1}}{\sqrt{9}} = \frac{1}{3}$$

$$18. \left(\frac{8}{27}\right)^{1/3} = \sqrt[3]{\frac{8}{27}} = \frac{\sqrt[3]{8}}{\sqrt[3]{27}} = \frac{2}{3}$$

$$19. 125^{2/3} = (\sqrt[3]{125})^2 = (5)^2 = 25$$

$$20. -81^{3/4} = -(\sqrt[4]{81})^3 = -(3)^3 = -27$$

$$21. (-27)^{4/3} = (\sqrt[3]{-27})^4 = (-3)^4 = 81$$

$$22. (-64)^{9/2} = (\sqrt{-64})^9 \Rightarrow \text{NO REAL SOLUTION!}$$

$$23. 25^{-1/2} = \frac{1}{25^{1/2}} = \frac{1}{\sqrt{25}} = \frac{1}{5}$$

$$24. 81^{-5/4} = \frac{1}{81^{5/4}} = \frac{1}{(\sqrt[4]{81})^5} = \frac{1}{(3)^5} = \frac{1}{243}$$

$$25. \left(\frac{27}{64}\right)^{-2/3} = \left(\frac{64}{27}\right)^{2/3} = \left(\sqrt[3]{\frac{64}{27}}\right)^2 = \left(\frac{4}{3}\right)^2 = \frac{16}{9}$$

$$\begin{aligned} 26. \quad 36^{1/2} + \left(\frac{1}{5}\right)^{-1} &= \sqrt{36} + 5 \\ &= 6 + 5 \\ &= 11 \end{aligned}$$

$$\begin{aligned} 27. \quad 4^{3/2} + 8^{1/3} &= (\sqrt{4})^3 + \sqrt[3]{8} \\ &= (2)^3 + 2 \\ &= 8 + 2 \\ &= 10 \end{aligned}$$

$$\begin{aligned} 28. \quad 27^{2/3} + 16^{3/4} - \left(\frac{1}{3}\right)^{-1} + (-3)^0 &= (\sqrt[3]{27})^2 + (\sqrt[4]{16})^3 - 3 + 1 \\ &= (3)^2 + (2)^3 - 2 \\ &= 9 + 8 - 2 \\ &= 17 - 2 \\ &= 15 \end{aligned}$$

$$29. 3^{-2} \cdot \left(\frac{1}{4}\right)^{-1} + 2^{-2}$$

$$= \frac{1}{3^2} \cdot 4 + \frac{1}{2^2}$$

$$= \frac{1}{9} \cdot 4 + \frac{1}{4}$$

$$= \frac{4}{9} + \frac{1}{4}$$

$$= \frac{16}{36} + \frac{9}{36}$$

$$= \frac{25}{36}$$

$$30. (3^{-2} + 2^{-2}) \div (3^{-1} + 2^{-1})$$

$$= \frac{3^{-2} + 2^{-2}}{3^{-1} + 2^{-1}}$$

$$= \frac{\frac{1}{3^2} + \frac{1}{2^2}}{\frac{1}{3} + \frac{1}{2}}$$

$$= \frac{\frac{1}{9} + \frac{1}{4}}{\frac{2}{6} + \frac{3}{6}}$$

$$= \frac{\frac{2}{6} + \frac{3}{6}}{\frac{4}{6} + \frac{9}{6}}$$

$$= \frac{\frac{5}{6}}{\frac{13}{6}}$$

$$= \frac{5}{13}$$

$$= \frac{5}{13}$$

$$= \frac{5}{13}$$

$$= \frac{5}{13}$$

$$= \frac{5}{13}$$

$$= \frac{5}{13}$$

$$= \frac{5}{13}$$

$$= \frac{5}{13}$$

$$31. \quad 4^{2x+3} = \sqrt{8}^{1/2}$$

$$(2^2)^{2x+3} = 8^{1/2}$$

$$2^{4x+6} = (2^3)^{1/2}$$

$$2^{4x+6} = 2^{3/2}$$

$$4x+6 = \frac{3}{2}$$

$$4x = -6 + \frac{3}{2}$$

$$4x = \frac{-12 + 3}{2}$$

$$4x = \frac{-9}{2}$$

$$x = \frac{-9}{2}$$

$$\frac{4}{4}$$

$$x = \frac{-9}{2} \times \frac{1}{4}$$

$$x = \frac{-9}{8}$$

$$32. \quad \sqrt{5} = \left(\frac{1}{125}\right)^{-\frac{x}{3}}$$

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

$$5^{1/2} = (5^{-3})^{-\frac{x}{3}}$$

$$5^{1/2} = 5^{3x/3}$$

$$5^{1/2} = 5^x$$

$$1/2 = x$$



$$33. 2^{-2(x+5)} - \sqrt{8} = 0$$

$$2^{-2x-10} - (2^3)^{1/2} = 0$$

$$2^{-2x-10} - 2^{3/2} = 0$$

$$2^{-2x-10} = 2^{3/2}$$

$$-2x-10 = \frac{3}{2}$$

$$-2x = \frac{3}{2} + 10$$

$$-2x = \frac{3}{2} + \frac{20}{2}$$

$$-2x = \frac{23}{2}$$

$$\frac{-2x}{-2} = \frac{23}{2} \cdot \frac{1}{-2}$$

$$x = \frac{23}{2} \cdot \frac{1}{2}$$

$$x = \frac{-23}{4}$$