# Try This 1 Solutions

**TT 1.** *Foundations and Pre-calculus Mathematics 10* (Pearson)

**a.** *Foundations and Pre-calculus Mathematics 10* (Pearson), "Exercises" questions 5, 8, 15 and 20 on pages 233 and 234

**5.** Since $2^{10} = 1024$, $2^{-10} = \frac{1}{1024}$.

**8. a)** $$\begin{aligned} 3^{-2} &= \frac{1}{3^2} \\ &= \frac{1}{9} \end{aligned}$$

**8. b)** $$\begin{aligned} 2^{-4} &= \frac{1}{2^4} \\ &= \frac{1}{16} \end{aligned}$$

**8. c)** $$\begin{aligned} (-2)^{-5} &= \frac{1}{(-2)^5} \\ &= -\frac{1}{32} \end{aligned}$$

**8. d)** $$\begin{aligned} \left(\frac{1}{3}\right)^{-3} &= \left(\frac{3}{1}\right)^3 \\ &= 27 \end{aligned}$$

**8. e)** $$\begin{aligned} \left(-\frac{2}{3}\right)^{-2} &= \left(-\frac{3}{2}\right)^2 \\ &= \left(-\frac{3}{2}\right)\left(-\frac{3}{2}\right) \\ &= \frac{9}{4} \end{aligned}$$

**8. f)** $$\begin{aligned} \frac{1}{5^{-3}} &= 5^3 \\ &= 125 \end{aligned}$$

**15.** $$\begin{aligned} \mathrm{I} &= 100d^{-2} \\ &= 100(23)^{-2} \\ &= \frac{100}{23^2} \\ &\doteq 0.1890359168\% \end{aligned}$$

The intensity of light 23 cm from the source would be 0.19%.

**20.** If a number is raised to a negative exponent, it will not always be less than 1. Some cases where a number raised to a negative exponent is greater than or equal to 1 are as follows:

- If a positive fraction less than 1 or a positive decimal less than 1 is raised to a negative exponent, the value of the power will be greater than 1.

$$\begin{aligned}\left(\frac{1}{3}\right)^{-3} &= \left(\frac{3}{1}\right)^{3} \\ &= 27\end{aligned}$$

- If a negative fraction less than 1 or a negative decimal less than 1 is raised to a negative even exponent, it will be greater than 1.

$$\begin{aligned}\left(-\frac{1}{2}\right)^{-4} &= \left(-\frac{2}{1}\right)^{4} \\ &= 16\end{aligned}$$

- If the number 1 is raised to any negative exponent, the result will always be 1.

$$\begin{aligned}1^{-3} &= \frac{1}{1^3} \\ &= 1\end{aligned}$$

- If the number –1 is raised to an even negative exponent, the result will always be 1.

$$\begin{aligned}(-1)^{-4} &= \frac{1}{(-1)^4} \\ &= \frac{1}{1} \\ &= 1\end{aligned}$$

**b.** *Foundations and Pre-calculus Mathematics 10* (Pearson), “Exercises” questions 4.b, 4.d, 7.b, 7.c, 8, 9, and 11.b, and d on pages 241 and 242

**4. b)** $$\begin{aligned}0.5^2 \times 0.5^3 &= 0.5^{2+3} \\ &= 0.5^5\end{aligned}$$

**4. d)** $\dfrac{0.5^2}{0.5^{-3}} = 0.5^{2-(-3)}$

$= 0.5^5$

**7. b)** $\left[\left(\dfrac{3}{5}\right)^3\right]^{-4} = \left(\dfrac{3}{5}\right)^{(3)(-4)}$

$= \left(\dfrac{3}{5}\right)^{-12}$

$= \left(\dfrac{5}{3}\right)^{12}$

**7. c)** $\left[\left(\dfrac{3}{5}\right)^{-3}\right]^{-4} = \left(\dfrac{3}{5}\right)^{(-3)(-4)}$

$= \left(\dfrac{3}{5}\right)^{12}$

**8. a)** $\left(\dfrac{a}{b}\right)^2 = \dfrac{a^2}{b^2}$

**8. b)** $\left(\dfrac{n^2}{m}\right)^3 = \dfrac{n^{2(3)}}{m^3}$

$= \dfrac{n^6}{m^3}$

**8. c)** $\left(\dfrac{c^2}{d^2}\right)^{-4} = \left(\dfrac{d^2}{c^2}\right)^4$

$= \dfrac{d^{2(4)}}{c^{2}(4)}$

$= \dfrac{d^8}{c^8}$

**8. d)** $\left(\dfrac{2b}{5c}\right)^2 = \dfrac{2^2 b^2}{5^2 c^2}$

$= \dfrac{4b^2}{25c^2}$

**8. e)** $\left(ab\right)^2 = a^2b^2$

**8. f)** $$\begin{aligned}\left(n^2m\right)^3 &= n^{(2)(3)}m^3\\ &= n^6m^3\end{aligned}$$

**8. g)** $$\begin{aligned}\left(c^3d^2\right)^{-4} &= c^{(3)(-4)}d^{(2)(-4)}\\ &= c^{-12}d^{-8}\\ &= \frac{1}{c^{12}d^8}\end{aligned}$$

**8. h)** $$\begin{aligned}\left(xy^{-1}\right)^{-3} &= x^{(-3)}y^{(-1)(-3)}\\ &= x^{-3}y^3\\ &= \frac{y^3}{x^3}\end{aligned}$$

**9. a)** Use the product law: When the bases are the same, add the exponents.

$$\begin{aligned}x^{-3}x^4 &= x^{-3+4}\\ &= x^1\end{aligned}$$

**9. b)** Use the product law: When the bases are the same, add the exponents.

$$\begin{aligned}a^{-4}a^{-1} &= a^{-4+(-1)}\\ &= a^{-5}\end{aligned}$$

Then write with positive exponents.

$$a^{-5} = \frac{1}{a^5}$$

**9. c)** Use the product law: When the bases are the same, add the exponents.

$$\begin{aligned}b^4b^{-3}b^2 &= b^{4-3+2}\\ &= b^3\end{aligned}$$

**9. d)** Use the product law: When the bases are the same, add the exponents.

$$\begin{aligned} m^8 m^{-2} m^{-6} &= m^{8+(-2)+(-6)} \\ &= m^0 \\ &= 1 \end{aligned}$$

**9. e)** Use the quotient law: When the bases are the same, subtract the exponents.

$$\begin{aligned} \frac{x^{-5}}{x^2} &= x^{-5-(2)} \\ &= x^{-7} \end{aligned}$$

Then write with positive exponents.

$$x^{-7} = \frac{1}{x^7}$$

**9. f)** Use the quotient law: When the bases are the same, subtract the exponents.

$$\begin{aligned} \frac{s^5}{s^{-5}} &= s^{5-(-5)} \\ &= s^{10} \end{aligned}$$

**9. g)** Use the quotient law: When the bases are the same, subtract the exponents.

$$\begin{aligned} \frac{b^{-8}}{b^{-3}} &= b^{-8-(-3)} \\ &= b^{-5} \end{aligned}$$

Then write with positive exponents.

$$b^{-5} = \frac{1}{b^5}$$

**9. h)** Use the quotient law: When the bases are the same, subtract the exponents.

$$\begin{aligned} \frac{t^{-4}}{t^{-4}} &= t^{-4-(-4)} \\ &= t^0 \\ &= 1 \end{aligned}$$

**11. b)** Use the power of a power law: For each power, multiply the exponents.

$$\begin{aligned}\left(2a^{-2}b^{2}\right)^{-2} &= 2^{-2}a^{(-2)(-2)}b^{(2)(-2)}\\ &= 2^{-2}a^{4}b^{-4}\end{aligned}$$

Then write with positive exponents.

$$\begin{aligned}2^{-2}a^{4}b^{-4} &= \frac{a^{4}}{2^{2}b^{4}}\\ &= \frac{a^{4}}{4b^{4}}\end{aligned}$$

**11. d)**
$$\begin{aligned}\left(\frac{3}{2}m^{-2}n^{-3}\right)^{-4} &= \left(\frac{3}{2}\right)^{-4}m^{8}n^{12}\\ &= \left(\frac{2}{3}\right)^{4}m^{8}n^{12}\\ &= \frac{2^{4}}{3^{4}}m^{8}n^{12}\\ &= \frac{16}{81}m^{8}n^{12}\end{aligned}$$

or

**11. d)** Use the power of a power law: For each power, multiply the exponents.

$$\begin{aligned}\left(\frac{3}{2}m^{-2}n^{-3}\right)^{-4} &= \left(\frac{3}{2}\right)^{-4}m^{(-2)(-4)}n^{(-3)(-4)}\\ &= \left(\frac{2}{3}\right)^{4}m^{8}n^{12}\\ &= \frac{16m^{8}n^{12}}{81}\end{aligned}$$