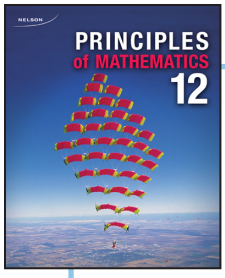


- If your have any difficulty with these solutions, please contact your teacher before continuing.

Page 444, *Your Turn* (*top of page*)

Let $x = \log 12$ and $y = \log 6$

Write the equations in exponential form:
$10^x = 12$ $10^y = 6$ ✓

$$\frac{12}{6} = 2$$

Therefore,
$$\frac{10^x}{10^y} = 2$$

Apply the exponent law for division: ✓
$10^{(x-y)} = 2$

Write the equation in logarithmic form:
$x - y = \log 2$

Substitute the original expressions for x and y: ✓
$\log 12 - \log 6 = \log 2$

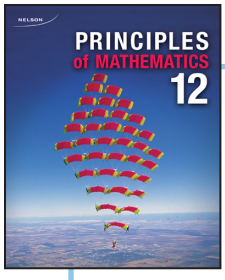
Page 444, *Your Turn* (*bottom of page*)

$\log_2 48 - \log_2 3$

$$= \log_2\left(\frac{48}{3}\right)$$ ✓
$$= \log_2(16)$$

The exponent that must be applied to 2 to get 16 is 4. ✓

$\log_2 48 - \log_2 3 = 4$



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Page 445, *Your Turn*

$2\log_3 6 + \log_3(0.75)$
$= \log_3 6^2 + \log_3(0.75)$
$= \log_3 36 + \log_3(0.75)$
$= \log_3(36 \cdot 0.75)$
$= \log_3 27$

The exponent that must be applied to 3 to get 27 is 3.

$2\log_3 6 + \log_3(0.75) = 3$

Page 450, *Reflecting*

A. Verify:

LS	RS
5000	$3215(1.024)^n$ $3215(1.024)^{15.620\ldots}$ 5000
LS = RS	

B. To solve, I could take the log with base 10 of both sides:
$\log 64 = \log 2^x$

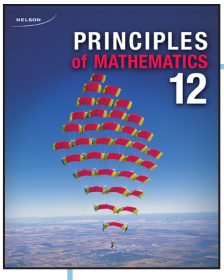
Apply the power law of logarithms to simplify the right side of the equation:
$\log 64 = x\log 2$

To isolate x, divide both sides by log 2:

$$x = \frac{\log 64}{\log 2}$$

Evaluate the expression on the right side using a calculator to determine x:
$x = 6$

The answer is 6.



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Page 451, *Your Turn*

$$5^{x+2} = 104$$

$$\log 5^{x+2} = \log 104$$

$$(x+2)\log 5 = \log 104$$

$$x+2 = \frac{\log 104}{\log 5}$$

$$x = \frac{\log 104}{\log 5} - 2$$

$$x = 0.885\ldots$$

To three decimal places,
$x = 0.886$

Page 453, *Your Turn* (*top of page*)

$$100 = 500\left(\frac{1}{2}\right)^{\frac{t}{3.6}}$$

$$\frac{100}{500} = \left(\frac{1}{2}\right)^{\frac{t}{3.6}}$$

$$\log\left(\frac{100}{500}\right) = \log\left(\frac{1}{2}\right)^{\frac{t}{3.6}}$$

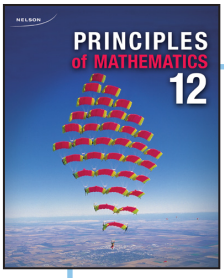
$$\log\left(\frac{100}{500}\right) = \left(\frac{t}{3.6}\right)\log\left(\frac{1}{2}\right)$$

$$\frac{\log\left(\frac{100}{500}\right)}{\log\left(\frac{1}{2}\right)} = \frac{t}{3.6}$$

$$2.321\ldots = \frac{t}{3.6}$$

$$8.36 = t$$

It will take about 8.4 days for the sample of radon-224 to decay to 100g.



- If your have any difficulty with these solutions, please contact your teacher before continuing.

Page 453, *Your Turn* (*bottom of page*)

$$5^{x-2} - 7^{x+1} = 0$$
$$5^{x-2} = 7^{x+1}$$
$$\log 5^{(x-2)} = \log 7^{(x+1)}$$
$$(x-2)\log 5 = (x+1)\log 7$$
$$x\log 5 - 2\log 5 = x\log 7 + \log 7$$
$$x\log 5 - x\log 7 = \log 7 + 2\log 5$$
$$x(\log 5 - \log 7) = \log 7 + 2\log 5$$
$$x = \frac{\log 7 + 2\log 5}{\log 5 - \log 7}$$
$$x = -15.349\ldots$$

To three decimal places, $x = -15.350$.

Page 454, *Your Turn*

$$\log_5 450$$
$$= \frac{\log 450}{\log 5}$$
$$= 3.7958\ldots$$

The value of $\log_5 450$, to three decimal places, is 3.796.