

# Chapter 3 Practice Test

For #1 to #6, choose the best answer.

- What is the value 3 in the power  $4^3$  called?
 

<b>A</b> base	<b>B</b> power
<b>C</b> exponent	<b>D</b> coefficient
- What is the coefficient in the expression  $-(-3)^5$ ?
 

<b>A</b> $-3$	<b>B</b> $-1$
<b>C</b> 1	<b>D</b> 3
- What expression is represented by  $(3^2)^4$ ?
 

<b>A</b> $(3 \times 3)(3 \times 3 \times 3 \times 3)$
<b>B</b> $(3 \times 3 \times 3 \times 3 \times 3 \times 3)$
<b>C</b> $(3 \times 3)(3 \times 3)(3 \times 3)(3 \times 3)$
<b>D</b> $(3 \times 3 \times 3 \times 3)(3 \times 3 \times 3 \times 3)$ $(3 \times 3 \times 3 \times 3)(3 \times 3 \times 3 \times 3)$
- What expression is equivalent to  $(5 \times 4)^2$ ?
 

<b>A</b> $10 \times 8$	<b>B</b> $5 \times 4^2$
<b>C</b> $5^2 \times 4$	<b>D</b> $5^2 \times 4^2$
- What is  $\frac{(-7)^3(-7)^5}{(-7)^2}$  expressed as a single power?
 

<b>A</b> $(-7)^6$	<b>B</b> $(-7)^{10}$
<b>C</b> $(-7)^{13}$	<b>D</b> $(-7)^{17}$
- Evaluate  $(7 - 2)^3 + 48 \div (-2)^4$ .
 

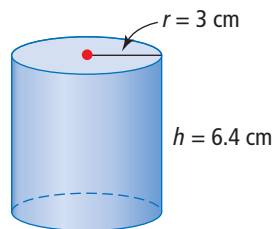
<b>A</b> 338	<b>B</b> 128
<b>C</b> 10.8125	<b>D</b> $-10.8125$

Complete the statements in #7 and #8.

- The expression  $10^5 \times 5^5$  written with only one exponent is  $\blacksquare$ .
- The expression  $\frac{5^6}{8^6}$  written with only one exponent is  $\blacksquare$ .

## Short Answer

- Write the expression  $\frac{4^4 \times 4}{4^2}$  in repeated multiplication form, and then evaluate.
- The formula for the volume of a cylinder is  $V = \pi r^2 h$ . Find the volume,  $V$ , of a cylinder with a radius of 3 cm and a height of 6.4 cm. Express your answer to the nearest tenth of a cubic centimetre.

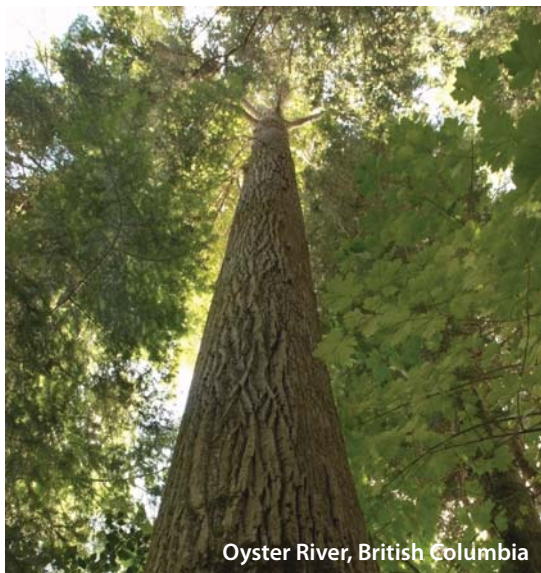


- A skydiver free falls before opening the parachute. What distance would the skydiver fall during 7s of free fall? Use the formula  $d = 4.9t^2$ , where  $d$  is distance, in metres, and  $t$  is time, in seconds.



- Write the calculator key sequence you would use to evaluate each expression. Then, evaluate.
  - $(1 - 3)^4 \div 4$
  - $(-2)^0 + 4 \times 17^0$
  - $16 - 9(2^3) + (-4)^2$
- The prime factorization of 243 is  $3 \times 3 \times 3 \times 3 \times 3$ . Write 243 as the product of two powers of 3 in as many ways as possible.

14. A formula for estimating the volume of wood in a tree is  $V = 0.05hc^2$ . The volume,  $V$ , is measured in cubic metres. The height,  $h$ , and the trunk circumference,  $c$ , are in metres. What is the volume of wood in a tree with a trunk circumference of 2.3 m and a height of 32 m? Express your answer to the nearest tenth of a cubic metre.



### Extended Response

15. Nabil made an error in simplifying the following expression.

a) Explain his mistake.

b) Determine the correct answer.

$$\begin{aligned} & (12 \div 4)^4 + (5 + 3)^2 \\ & = (3)^4 + 5^2 + 3^2 \\ & = 81 + 25 + 9 \\ & = 106 + 9 \\ & = 115 \end{aligned}$$

16. A type of bacterium triples in number every 24 h. There are currently 300 bacteria.

a) Create a table to show the number of bacteria after each of the next seven days. Express each number of bacteria as the product of a coefficient and a power.

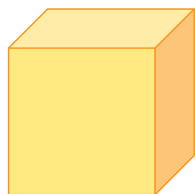
b) Determine a formula that will calculate the number of bacteria,  $B$ , after  $d$  days.

c) Use the formula to find the number of bacteria after 9 days.

d) How many were there 24 h ago? Explain your reasoning.

### Math Link: Wrap It Up!

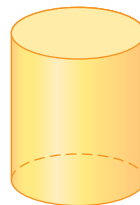
Create a mobile that uses at least three different types of regular three-dimensional shapes such as a cube, a square-based prism, and a cylinder. You may wish to choose a different type of geometric shape to build as well.



cube



square-based prism



cylinder

- Choose whole-number dimensions between 10 cm and 20 cm for each shape.
- Use a ruler and a piece of construction paper or other heavy paper to draw a net for each shape.
- Build each shape.
- Use expressions in exponential form to label the surface area and the volume of each shape.
- Evaluate each expression. Show all of your work.
- Make your mobile. Use colour and creativity!