

Learning Outcomes Covered:

2C: I can use order of operations to evaluate expressions containing exponents.

CONTENT Assessment Questions:

1. Evaluate. Show all your steps.

$$\begin{aligned} \text{a) } & 5 + 3^2 \\ & = 5 + 9 \\ & = 14 \end{aligned}$$

$$\begin{aligned} \text{b) } & (5 - 3)^2 \\ & = (2)^2 \\ & = 4 \end{aligned}$$

$$\begin{aligned} \text{c) } & 5^2 + 3^2 \\ & = 25 + 9 \\ & = 34 \end{aligned}$$

$$\begin{aligned} \text{d) } & 4 \times 2^3 \\ & = 4 \times 8 \\ & = 32 \end{aligned}$$

$$\begin{aligned} \text{e) } & (4 \times 2)^3 \\ & = (8)^3 \\ & = 512 \end{aligned}$$

$$\begin{aligned} \text{f) } & 4^3 \div 2^3 \\ & = 64 \div 8 \\ & = 8 \end{aligned}$$

$$\begin{aligned} \text{g) } & (18 \div 3^2 + 1)^4 \cdot 4^2 \\ & = (18 \div 9 + 1)^4 - 16 \\ & = (2 + 1)^4 - 16 \\ & = (3)^4 - 16 \\ & = 81 - 16 \\ & = 65 \end{aligned}$$

$$\begin{aligned} \text{h) } & 3^3 \div 9[(-3)^0 - 2^2]^2 \\ & = 27 \div 9[1 - 4]^2 \\ & = 27 \div 9[-3]^2 \\ & = 27 \div 9(9) \\ & = 27 \div 81 = \frac{1}{3} \end{aligned}$$

CURRICULAR COMPETENCIES Questions:

1. Insert brackets to make each statement true.

(US)

$$\text{a) } 15 = (3 + 2) \times 4^2 - 5 = 43$$

$$\text{b) } 15 \div 3 + 2 \times (4^2 - 5) = 27$$

2. Aftab, Shane, and Kyra got different answers when they evaluated this expression:

$$(-4)^2 - 3[(-9) \div 3]^2$$

Aftab's answer was 97, Shane's answer was 43, and Kyra's answer was 19. (CmRp)

- a) Show the correct solution to the expression $(-4)^2 - 3[(-9) \div 3]^2$

$$\begin{aligned} &= 16 - 3[-3]^2 \\ &= 16 - 3(9) \\ &= 16 - 27 = -11 \end{aligned}$$

- b) Show and explain how the students who got the wrong answer may have evaluated. Where did each student go wrong?

Aftab: Aftab did not perform "exponent" first, instead he evaluated this question in the order from left to right.

$$16 + (27 \div 3)^2 = 16 + (9)^2 = 97.$$

Shane: Shane miscalculated $(-9 \div 3)^2 = -9$ so $(-4)^2 - 3[(-9) \div 3]^2 = 16 + 27 = 43.$

Kyra: The exponent 2 only applied to 3, so $(-4)^2 - 3[(-9) \div 3]^2 = 16 - 3[-9 \div 9] = 16 - 3[-1] = 19$

2. The formula for the volume, V , of a cylinder with height, h , and radius, r , is $V = \pi r^2 h$. Mr. Lee made 4 L of salsa and stores it in jars with a radius of 3 cm and a height of 8 cm. Note: 1 L = 1000 mL = 1000 cm³. Write an expression to determine the number of jars he needs and then round to the nearest whole number of jars. (CnRf)

$$\begin{aligned} V &= \pi(3)^2(8) \\ &= 226.19 \text{ cm}^3 \end{aligned} \quad \begin{aligned} 4000 &\div 226.19 \\ &= 17.68 \end{aligned}$$

$$\begin{aligned} 4\text{L} &= 4 \times 1000 \\ &= 4000 \text{ cm}^3 \end{aligned}$$

\therefore He needs 18 jars.

ONGOING LEARNING ACTIVITIES:

CORE: Page 66: Curricular Competencies: 7, 10acf, 12, 15, 17, 18, 22
Content: 4, 5, 10bde, 16, 20

ADVANCED: Page 68: 24, 25, 27