

PROBLEM SOLVING INVOLVING ALGEBRAIC EXPRESSIONS

1. The age of Azhar's mother was four times the age of Azhar last year. If Azhar is n years old now, state the age of Azhar's mother seven years later in terms of n .

$$\begin{aligned}\text{Azhar's mother's age last year} &= 4 \times \text{Azhar's age} \\ &= 4 \times n \\ &= 4n\end{aligned}$$

$$\text{Azhar's mother's age seven years later} = 4n + 7$$

2. Aina makes a cubic model from a manila card. If the volume of the cube is $(2 + 3p)^3 \text{ cm}^3$, find the total surface area of the cube in terms of p .

Let's refresh a bit : Do you remember Chapter 3? When we say that the volume of a cube is 27, how did we find the length of a cube?

That's right, we used cube root.

$$\text{Length of a side of a cube with volume } 27 = \sqrt[3]{27} = \sqrt[3]{3^3} = 3$$

$$\text{Back to Question 2 : Length of a side of a cube} = \sqrt[3]{(2 + 3p)^3} = 2 + 3p$$

$$\text{Surface area of one face of a cube} = (2 + 3p) \times (2 + 3p) = (2 + 3p)^2$$

$$\text{Number of surfaces a cube has} = 6$$

Total surface area of the cube in terms of p

$$= \text{Surface area of one cube} \times \text{Number of surfaces in a cube}$$

$$= (2 + 3p)^2 \times 6$$

$$= 6(2 + 3p)^2 \text{ cm}^2$$

3. The area of a rectangle is $12a^3b^2$. Express the length of the rectangle in terms of ab .



Length of rectangle \times Width of rectangle = Area of rectangle

Length of rectangle \times $= 12a^3b^2$ [HINT : look at the diagram for width]

$$\begin{aligned} \text{Length of rectangle} &= \frac{12a^3b^2}{3ab} \\ &= \frac{\begin{array}{ccccc} \times & \times & \times & \times & \times \\ \times & & & & \times \end{array}}{\times \times} \\ &= 4a^2b \end{aligned}$$

4. Zuriana's mother gives a certain amount of money to Zuriana to buy satay and otak-otak.
Zuriana buys m sticks of satay which costs RM x for 5 sticks and receives a balance of 80 cents.
Then, she buys $2m$ pieces of otak-otak which costs RM y per piece and receives a balance of 60 cents.
(a) Write an algebraic expression for the total amount of money received by Zuriana.

| Type of Food | Number of Sticks / Pieces | Price per stick (RM) / Price per piece (RM) | Total price (RM) |
|--------------|---------------------------|---|-------------------------------------|
| Satay | | $\frac{x}{5}$ | $\frac{x}{5} \times = \frac{mx}{5}$ |
| Otak-otak | | | $2m \times y =$ |

Total amount of money received by Zuriana

= Total price of Satay + Balance + Total price of Otak-otak + Balance

$$= \frac{mx}{5} + + 2my +$$

$$= \frac{mx}{5} + 2my + 1.40$$

- (b) If $m = 10$, $x = 4$ and $y = 12$, find the total amount of money that Zuriana received from her mother.

Total amount of money Zuriana received

$$= \frac{mx}{5} + 2my + 1.40$$

$$= \frac{(\quad)(\quad)}{5} + 2(\quad)(\quad) + 1.40$$

$$= RM$$