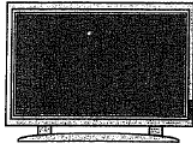


Sam is interested in buying a TV. At Fair Deal, the TV is regularly priced at \$599.99 and is on sale for 20% off the regular price. At Big Big Discount, the same TV is regularly priced at \$899.99 and is on sale for 30% off the regular price.



What is the difference in the sale price of the TV between these two stores?

Show your work.

$$\begin{aligned} \text{Fair deal} &= 599.99 - 20\% \\ 0.20(599.99) &= 120 \rightarrow \begin{array}{r} 599.99 \\ -120.00 \\ \hline 479.99 \end{array} \\ \text{cost of tv} &= \boxed{479.99\$} \end{aligned}$$

$$\begin{aligned} \text{big big discount} &= 899.99(0.30) = 270 \rightarrow \begin{array}{r} 899.99 \\ -270.00 \\ \hline 629.99 \end{array} \\ \text{cost of tv} &= \boxed{629.99\$} \end{aligned}$$

$$\begin{aligned} \text{bbd} &= 629.99 \\ \text{fd} &= -479.99 \\ \hline \text{difference} &= \boxed{150.00\$} \end{aligned}$$

∴ Therefore if you buy your tv at fair deal you'll save 150\$.

Annotation:
Student demonstrates a thorough understanding of the concepts; determines the discounts, sale prices and the difference between the sale prices accurately.

Learning Goals

1. To understand that to solve for the area of a composite shape you need to split the shape up into smaller parts and add/subtract the areas.
2. To understand how to calculate the perimeter of a regular polygon.
3. To understand that to calculate the area of a regular polygon you must split the shape up into a series of triangles and sum all the area calculations.

8.2 - Problems Involving Composite Shapes

You can determine the area or perimeter of a geometric shape by decomposing it into simpler shapes whose formulas you know.

Composite Shape - a shape that can be divided into more than one of the basic shapes (i.e. square, rectangle, circle, semi-circle, triangle, etc).

Area Formulas to Know:

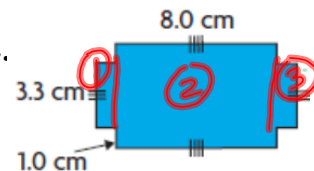
$$\text{Area}_{\text{rectangle}} = l \times w$$

$$\text{Area}_{\text{circle}} = \pi r^2$$

$$\text{Area}_{\text{triangle}} = (b \times h) \div 2$$

Example One

Calculate the area of the following shape.



Shape 1

$$\begin{aligned} A &= l \times w \\ &= 3.3 \times 1 \\ &= 3.3 \text{ cm}^2 \end{aligned}$$

Shape 2

$$\begin{aligned} A &= l \times w \\ &= 8 \times 5.3 \\ &= 42.4 \text{ cm}^2 \end{aligned}$$

Shape 3

$$\begin{aligned} A &= l \times w \\ &= 3.3 \times 1 \\ &= 3.3 \text{ cm}^2 \end{aligned}$$

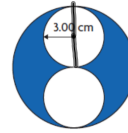
$$A_{\text{TOT}} = A_1 + A_2 + A_3$$

$$= 3.3 + 42.4 + 3.3$$

$$= 49 \text{ cm}^2$$

Example Two

Kristen is designing a logo in her graphic arts class. How can Kristen calculate the area of the shaded section?

Area of Big Circle

$$\begin{aligned} A &= \pi r^2 \\ &= \pi \times (6)^2 \\ &= 113.1 \text{ cm}^2 \end{aligned}$$

Area of Small Circle

$$\begin{aligned} A &= \pi r^2 \\ &= \pi (3)^2 \\ &= 28.26 \text{ cm}^2 \times 2 \text{ (there are 2 small circles)} \\ &= 56.52 \text{ cm}^2 \end{aligned}$$

Area of shaded region

$$\begin{aligned} A_{\text{shaded}} &= A_{\text{big}} - 2A_{\text{small}} \\ &= 113.1 - 56.52 \\ &= 56.58 \text{ cm}^2 \end{aligned}$$

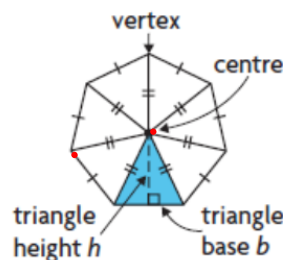
Perimeter of a Regular Polygon

The formula for the perimeter of a regular polygon is $P = n \times s$, where n is the number of sides and s is the length of each side.

Area of a Regular Polygon

To calculate the area of a regular polygon, **divide it into triangles**, and then add their areas. Form the triangles by drawing a line from the centre to each vertex. The polygon side length is the base of each triangle, and the distance from the centre to the middle of each side is the height.

$$A = (b \times h) \div 2$$



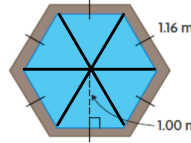
Example Three

Andrew is replacing a regular hexagonal window. The side length is 1.16 m and the distance from the centre to the middle of each side is 1.00 m. How can Andrew calculate the length of the wooden framing and the area of the glass?

1. Perimeter

$$\begin{aligned} P &= n \times s \\ &= 6 \times 1.16 \\ &= 6.96 \text{ m} \end{aligned}$$

\therefore 6.96 m of wooden framing is needed.

2. Area (of individual triangle)

$$\begin{aligned} A &= (b \times h) \div 2 \\ &= (1.16 \times 1) \div 2 \\ &= 0.58 \text{ m}^2 \end{aligned}$$

3. Area of hexagon

$$\begin{aligned} A &= 0.58 \times 6 \\ &= 3.48 \text{ m}^2 \end{aligned}$$

Complete: p. 440 - 441 #1 - 3, 5.