Essential Math 11 – Surface Area Quiz

1. The box below is used to display artifacts at a museum. The base is 4 feet by 2 feet. The sides are 2.5 feet tall. Draw a net and then calculate the area of glass needed to create the box. (2 marks for net, 4 marks for surface area)

![Diagram of a box with measurements and calculations]

Total $SA = 10 + 8 + 10 + 8 + 5 + 5 = 46 \text{ ft}^2$

1
Essential Math 11 – Surface Area Quiz

2. A square-based pyramid is shown below. Draw a net and then calculate the surface area of the pyramid. (2 marks for net, 7 marks for surface area)

Base 10 ft x 10 ft
Height 12 ft

\[
\begin{align*}
\text{Base area} & = 10 \times 10 = 100 \text{ ft}^2 \\
\text{Area of triangle} & = \frac{10 \times 13 \times 4}{2} = 260 \text{ ft}^2 \\
\text{Total SA} & = 360 \text{ ft}^2
\end{align*}
\]

(1)

\[c = 13\text{ ft} \quad (2)\]

\[5\text{ ft} \quad (2)\]
3. Calculate the surface area of the shape shown below. Note: You do not have to draw a net. (6 marks)

\[ 3 \times 11 = 33 \]
\[ 4 \times 11 = 44 \quad (3) \]
\[ 5 \times 11 = 55 \]
\[ \frac{3 \times 4}{2} \times 2 \text{ ends} = 12 \]

Total SA = 144 cm² (1)
Essential Math 11 – Surface Area Quiz

4. The diagram below is a running track at a high school.

a) Convert 0.15 km to meters. (1 mark)

\[ 0.15 \times 1000 = 150 \text{ m} \]

b) Calculate the surface area of the inside of the running track. (5 marks)

\[ A = \pi r^2 = \pi \times 25^2 = 1963.495 \text{ m}^2 \]

\[ \text{Rect Area} = 50 \times 150 = 7500 \text{ m}^2 \]

Total \( SA \) = 9463.5 m\(^2\)

C) Grass R Us charges $2.95 per square meter to install sod. Both taxes are added as well (8% PST and 5% GST). How much would it cost to have sod installed on the inside of this running track? (3 marks)

\[ 9463.5 \times 2.95 = \$27,917.33 \]

\[ \times 1.13 \text{ (2)} \]

\[ \$31546.58 \]
5. An aluminum soup can is sketched below:

Calculate the surface area of the tin, including both top and bottom. (7 marks)

\[ A_{\text{top bottoms}} = \pi \times 3.5^2 \times 2 = 76.969 \] (2 marks)

\[ C = \pi d = \pi \times 7 = 21.99 \] (2 marks)

\[ 21.99 \times 12 = 263.88 \] (2 marks)

Total SA = 76.969 + 263.88 = 346.85 cm² (1 mark)
A painter needs to estimate the amount of paint necessary to paint a bathroom.

- The dimensions of the walls are given.
- The walls are 8 feet high.
- The ceiling and the walls will be given two coats of paint.
- Paint coverage is 300 square feet per 3.7 Litre can.

Calculate the number of 3.7 L cans needed. (10 marks)

Ceiling: 
\[
12 \times 6 = 72
\]
\[
= 144 \text{ ft}^2
\]

Walls:
\[
6 \times 8 \times 2 = 96 \text{ (1)}
\]
\[
12 \times 8 \times 2 = 192 \text{ (1)}
\]
\[
= 288 \text{ ft}^2
\]

Subtract ceiling:
\[
= 288 \text{ ft}^2 - 72 \text{ ft}^2 = 216 \text{ ft}^2
\]

2 coats:
\[
= 216 \text{ ft}^2 \times 2 = 432 \text{ ft}^2
\]

Window: 
\[
3 \times 3 = 9 \text{ ft}^2
\]

Doors:
\[
2 \times 7 \times 2 = 28 \text{ ft}^2
\]

Total:
\[
251 \text{ ft}^2
\]

Paint coverage:
\[
\frac{502 \text{ ft}^2}{300 \text{ ft}^2} = 1.67
\]

So 2 cans of paint without ceiling.
3.153 - 300 = 646 ft²
646 / 5.6 = 116
116 x 2 = 232
232 / 3.7 = 62
Total SA = 360

96 ft

48 ft

12 x 6 = 72

12 ft x 12 = 144

144 / 2 = 72

6 x 6 = 36

8 x 12 = 96

12 ft cell

12 ft wall

Total SA = 360

Doors

28

37
tall win + door

2 x 7 = 14

14 doors

6 x 3 = 18

9 windows