

Grade 6 · Surface Area and Nets · Worksheet

Answer Key

Common Core 6.G.A.4 · mathovore.fr

Every solution lists each face, shows the area of every face, and adds them to find the surface area in square units. Use the answers to check your work, and compare your count of faces with the nets drawn in the solution figures for the prisms and the pyramids.

Grade 6 Common Core: 6.G.A.4

Problem 1: Cube net

Each face: $5 \times 5 = 25 \text{ in}^2$.

$$SA = 6 \times 25 = 150$$

The surface area is 150 in^2 .

Problem 2: Cube with 7 cm edges

Each face: $7 \times 7 = 49 \text{ cm}^2$.

$$SA = 6 \times 49 = 294$$

The surface area is 294 cm^2 .

Problem 3: Name the solid

Two triangles and three rectangles fold into a triangular prism.

$$2 + 3 = 5$$

It is a **triangular prism with 5 faces**.

Problem 4: Name the solids

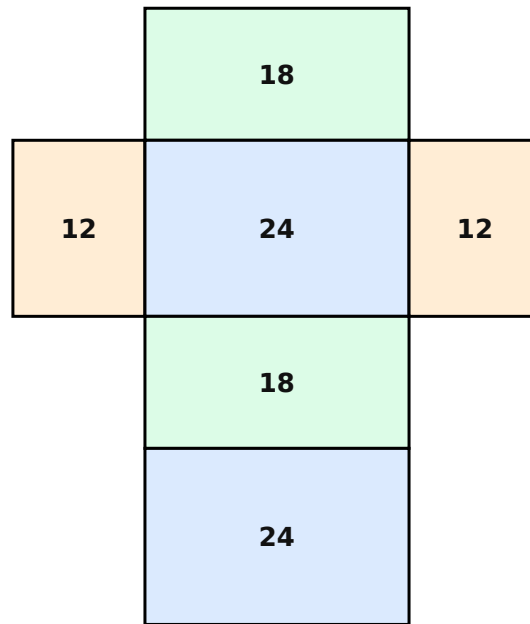
- One square base and four triangular faces fold into a **square pyramid**. $1 + 4 = 5$, so it has **5 faces**
- Six rectangles fold into a **rectangular prism**. It has **6 faces**
- Four triangles fold into a **triangular pyramid**. It has **4 faces**

Problem 5: Rectangular prism

Faces come in pairs: $6 \times 4 = 24$, $6 \times 3 = 18$, and $4 \times 3 = 12$.

$$SA = 2(24 + 18 + 12) = 2(54) = 108$$

The surface area is 108 ft^2 .



Solution figure: the six face areas are 24, 18, 12, 24, 18, and 12.

Problem 6: Flat box

Faces come in pairs: $9 \times 5 = 45$, $9 \times 2 = 18$, and $5 \times 2 = 10$.

$$SA = 2(45 + 18 + 10) = 2(73) = 146$$

The surface area is 146 in^2 .

Problem 7: Cereal box

$8 \times 2.5 = 20$, $8 \times 12 = 96$, and $2.5 \times 12 = 30$.

$$SA = 2(20 + 96 + 30) = 2(146) = 292$$

The box uses 292 in^2 of cardboard.

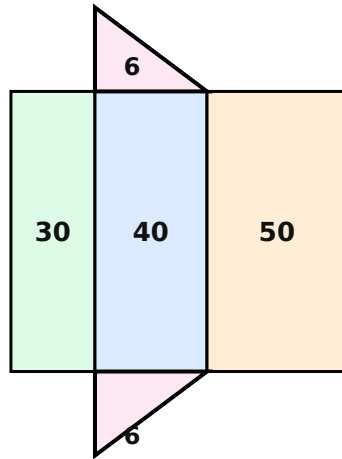
Problem 8: Triangular prism

Each triangle: $\frac{1}{2} \times 3 \times 4 = 6 \text{ in}^2$.

Rectangles: $3 \times 10 = 30$, $4 \times 10 = 40$, $5 \times 10 = 50$.

$$SA = 6 + 6 + 30 + 40 + 50 = 132$$

The surface area is 132 in^2 .



Solution figure.

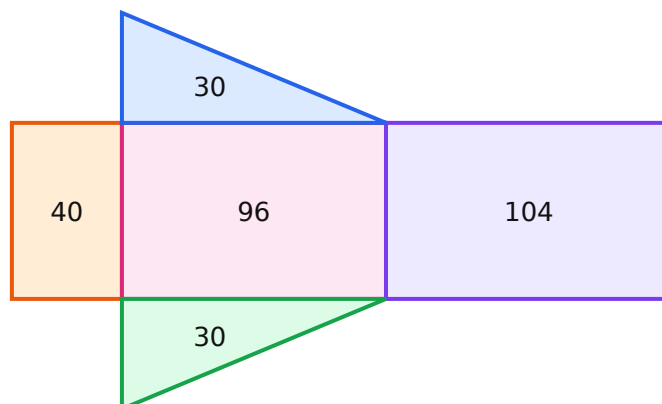
Problem 9: Triangular prism with right-triangle ends

Each triangle: $\frac{1}{2} \times 5 \times 12 = 30 \text{ in}^2$.

Rectangles: $5 \times 8 = 40$, $12 \times 8 = 96$, $13 \times 8 = 104$.

$$SA = 30 + 30 + 40 + 96 + 104 = 300$$

The surface area is 300 in^2 .



Face areas of the net.

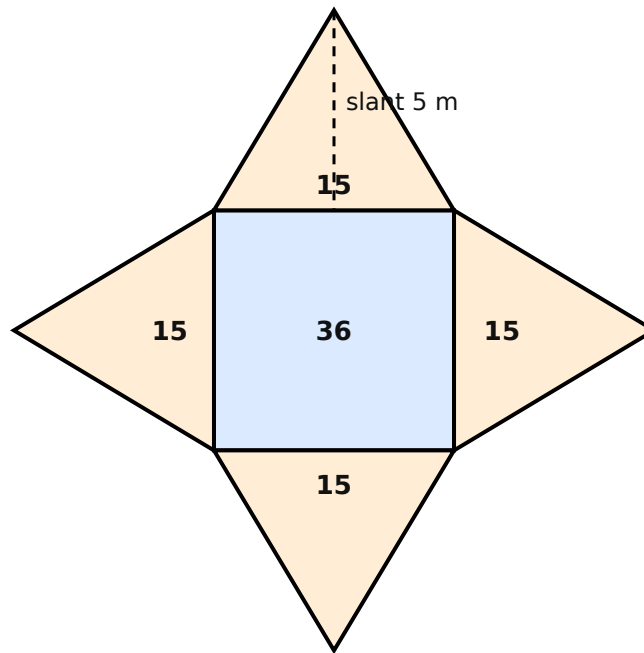
Problem 10: Square pyramid

Base: $6 \times 6 = 36 \text{ m}^2$.

One triangle: $\frac{1}{2} \times 6 \times 5 = 15 \text{ m}^2$. Four triangles: $4 \times 15 = 60 \text{ m}^2$.

$$SA = 36 + 60 = 96$$

The surface area is 96 m^2 .



Solution figure.

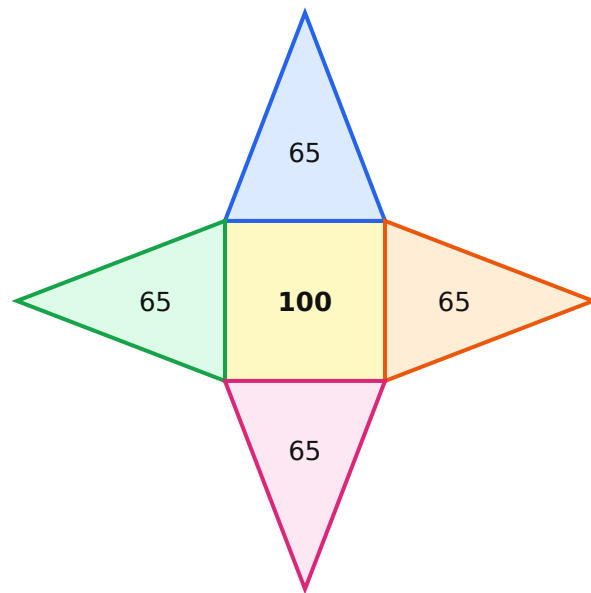
Problem 11: Large square pyramid

Base: $10 \times 10 = 100 \text{ ft}^2$.

One triangle: $\frac{1}{2} \times 10 \times 13 = 65 \text{ ft}^2$. Four triangles: $4 \times 65 = 260 \text{ ft}^2$.

$$SA = 100 + 260 = 360$$

The surface area is 360 ft^2 .



Face areas of the net.

Problem 12: Open-top box

Base: $10 \times 8 = 80$. Two long sides: $2 \times (10 \times 4) = 80$. Two short sides: $2 \times (8 \times 4) = 64$.

$$80 + 80 + 64 = 224$$

The surface area is 224 in^2 .

Problem 13: Missing edge

$$6s^2 = 216, \text{ so } s^2 = 36.$$

$$6 \times 6 = 36, \text{ so } s = 6.$$

The edge is 6 in .

Problem 14: Missing height

$$\text{Top and bottom: } 2 \times (8 \times 5) = 80 \text{ cm}^2.$$

$$\text{The four sides have the rest: } 184 - 80 = 104 \text{ cm}^2.$$

The four sides wrap around the base, whose perimeter is $2(8+5) = 26 \text{ cm}$. So $26h = 104$ and $h = 104 \div 26 = 4$.

$$\text{Check: } 2(40 + 32 + 20) = 2(92) = 184.$$

The height is 4 cm .

Problem 15: Storage cube

Each face: $2.5 \times 2.5 = 6.25 \text{ ft}^2$.

$$SA = 6 \times 6.25 = 37.5 \text{ ft}^2$$

Cost: $37.5 \times \$3 = \$112.50$.

The surface area is 37.5 ft^2 and the fabric costs \$112.50.

Problem 16: Gift wrap

$$12 \times 9 = 108, 12 \times 3 = 36, 9 \times 3 = 27.$$

$$SA = 2(108 + 36 + 27) = 2(171) = 342$$

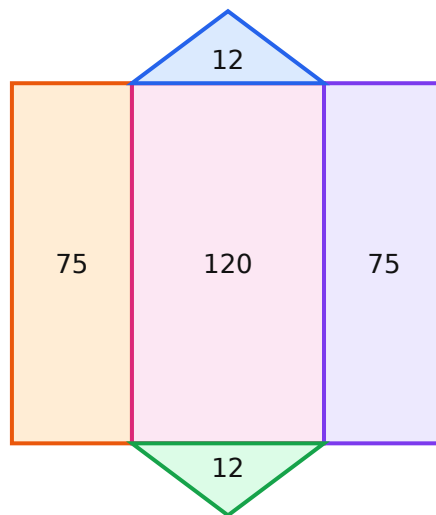
She needs 342 in^2 of paper.

Problem 17: Chocolate box

a. $\frac{1}{2} \times 8 \times 3 = 12.12 \text{ cm}^2$

b. Ends: $2 \times 12 = 24$. Rectangles: $8 \times 15 = 120$ and two of $5 \times 15 = 75$. $SA = 24 + 120 + 75 + 75 = 294.294 \text{ cm}^2$

c. $300 - 294 = 6$. **Yes, the foil is enough**, with 6 cm^2 left over.



Face areas of the net.

Problem 18: Toy chest paint

$$4 \times 2 = 8, 4 \times 2 = 8, 2 \times 2 = 4.$$

$$SA = 2(8 + 8 + 4) = 40 \text{ ft}^2.$$

Two coats: $2 \times 40 = 80 \text{ ft}^2$. Quarts: $80 \div 20 = 4$. Cost: $4 \times \$9 = \$36$.

The surface area is 40 ft^2 and the paint costs \$36.

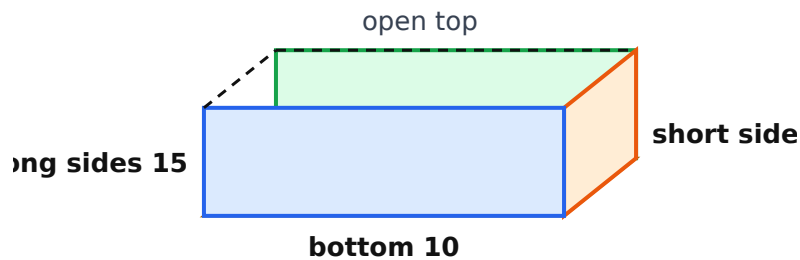
Problem 19: Planter box

Bottom: $5 \times 2 = 10 \text{ ft}^2$.

Two long sides: $2 \times (5 \times 1.5) = 15 \text{ ft}^2$. Two short sides: $2 \times (2 \times 1.5) = 6 \text{ ft}^2$.

$10 + 15 + 6 = 31$. Cost: $31 \times \$4 = \$124$.

Mei needs 31 ft^2 of cedar costing \$124.



Areas of the planter faces.

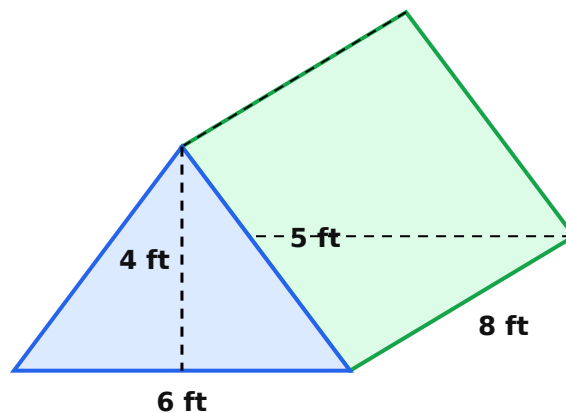
Problem 20: Camping tent

Two ends: $2 \times (\frac{1}{2} \times 6 \times 4) = 24 \text{ ft}^2$.

Two slanted sides: $2 \times (5 \times 8) = 80 \text{ ft}^2$. Floor: $6 \times 8 = 48 \text{ ft}^2$.

$24 + 80 + 48 = 152$. Cost: $152 \times \$2.50 = \$380$.

The tent needs 152 ft^2 of fabric costing \$380.



Solution figure: ends 24, slanted sides 80, floor 48 square feet.