5-6-19

Aim: SWBAT calculate the actual and estimated surface area of prisms and pyramids.

HW: Finish Packet Page 11 (top 2 rows)

Test Friday

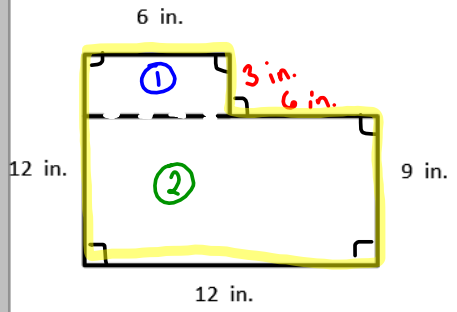
Do Now: Packet Page 10

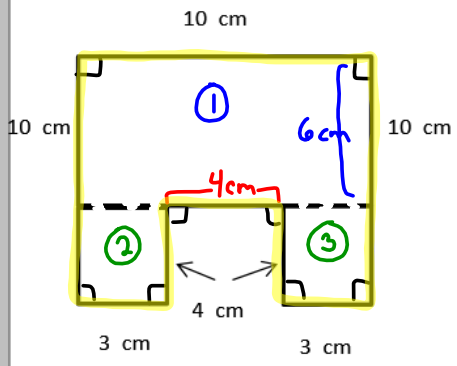
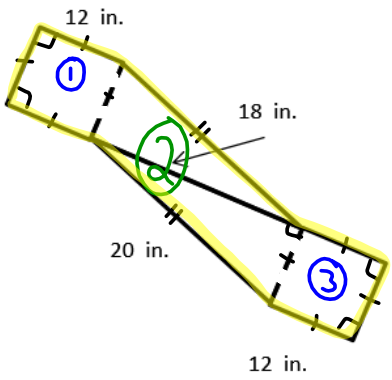
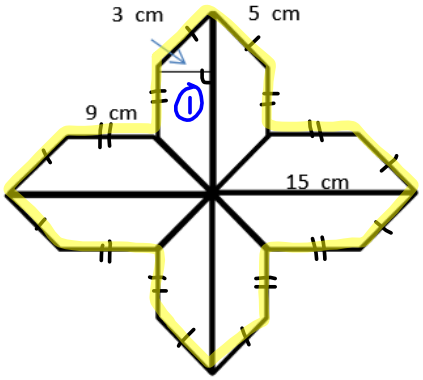
Find the unknown value, algebraically.

	A	B
11 *	Square: $\mathcal{A} = 36\ yd^2$, $s =$ 6 yd.	Square: $\mathcal{P} = 24\ m$, $s =$ _____ $P = 4s$ $\frac{24}{4} = \frac{4s}{4}$ $6_m = s$
12 *	Square: $\mathcal{A} = 144\ yd^2$, $s =$ 12 yd.	Square: $\mathcal{A} =$ _____, $s = 18\ in.$ $A = s^2$ $A = 18^2$ $A = 324\ in.^2$
13	Rectangle: $\mathcal{A} =$ _____, $l = 17\ m$, $w = 9\ m$ $A = lw$ $A = 17 \cdot 9$ $A = 153\ m^2$	Rectangle: $\mathcal{A} = 88\ in.^2$, $l =$ _____, $w = 8\ in.$ $A = lw$ $\frac{88}{8} = \frac{l \cdot 8}{8}$ $11_{in.} = l$
14	Triangle: $\mathcal{A} = 32\ mm^2$, $b = 8\ mm$, $h =$ _____ $A = \frac{bh}{2}$ $2 \cdot 32 = \frac{8h}{2} \cdot 2$ $\frac{64}{8} = \frac{8h}{8}$ $8_{mm} = h$	Triangle: $\mathcal{P} = 60\ m$, $s_1 = 23\ m$, $s_2 = 17\ m$, $s_3 =$ _____ $P = s_1 + s_2 + s_3$ $60 = 23 + 17 + s_3$ $60 = 40 + s_3$ $-40 \quad -40$ $20 = s_3$

15	**Parallelogram:** $A = 84\ cm^2$, $b =$ _____, $h = 12\ cm$ $A = bh$ $\frac{84}{12} = \frac{b \cdot 12}{12}$ $7_{cm} = b$	**Parallelogram:** $A = 105\ m^2$, $b = 5\ m$, $h =$ _____ $A = bh$ $\frac{105}{5} = \frac{5h}{5}$ $21_{m} = h$
16	**Trapezoid:** $A = 100\ in.^2$, $b_1 = 10\ in.$, $b_2 = 15\ in.$, $h =$ _____ $A = \frac{(b_1+b_2)h}{2}$ $100 = \frac{(10+15)h}{2}$ $100 = \frac{25h}{2}$ $\frac{100}{12.5} = \frac{12.5h}{12.5}$ $8_{in.} = h$	**Trapezoid:** $A = 78\ ft.^2$, $b_1 = 12\ ft.$, $b_2 =$ _____, $h = 6\ ft.$ $A = \frac{(b_1+b_2)h}{2}$ $78 = \frac{(12+b_2)\cdot 6}{2}$ $2 \cdot 78 = \frac{72+6b_2}{2} \cdot 2$ $156 = 72 + 6b_2$ $-72 \quad -72$ $\frac{84}{6} = \frac{6b_2}{6}$ $14 = b_2$

Find the perimeter and area of the figure.

		Perimeter	Area
17		$P = 6+3+6+9+12+12$ $P = 48\ in.$	① $A = lw$ $A = 6 \cdot 3$ $A = 18\ in.^2$ ② $A = lw$ $A = 12 \cdot 9$ $A = 108\ in.^2$ Total Area $= 18 + 108$ Total Area $= 126\ in.^2$

		PERIMETER	AREA
18		$P = 10+10+3+4+4+4+3+10$ $P = 48$ cm	① $A = lw$ $A = 10 \cdot 6$ $A = 60 cm^2$ ② and ③ $A = lw$ $A = 3 \cdot 4$ $A = 12 cm^2$ Total Area $= 60+12+12$ Total Area $= 84 cm^2$
19		$P = 12+12+12+20+12+12+12+20$ $P = 112$ in.	① and ③ $A = s^2$ $A = 12^2$ $A = 144 in.^2$ ② $A = bh$ $A = 12 \cdot 18$ $A = 216 in.^2$ Total Area $= 144+144+216$ Total Area $= 504 in.^2$
20		$P = 5+9+9+5+5+9+9+5+5+9+9+5+5+9+9+5$ $P = 112$ cm	① $A = \frac{(b_1+b_2)h}{2}$ $A = \frac{(9+15) \cdot 3}{2}$ $A = \frac{24 \cdot 3}{2}$ $A = 36 in.^2$ Total Area $= 8 \cdot 36$ Total Area $= 288 cm^2$

Aim: SWBAT construct prisms and pyramids and investigate their features.

Do Now: What are some differences between 2-dimensional and 3-dimensional figures?

Complete each table and sentence.

Prism	# of Bases	Shape of Base(s)	# of Faces	Shape of Faces
Cube	2	Squares	4	Squares
Rectangular Prism	2	Rectangles	4	Rectangles
Triangular Prism	2	Triangles	3	Rectangles
Pentagonal Prism (5)	2	Pentagons	5	Rectangles
Octagonal Prism (8)	2	Octagons	8	Rectangles

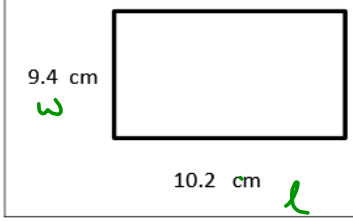
A prism has 2 base polygons and as many parallelograms (usually rectangles) as the polygonal bases have sides.

Pyramid	# of Bases	Shape of Base(s)	# of Faces	Shape of Faces
Triangular Pyramid	1	Triangle	3	Triangles
Square Pyramid	1	Square	4	Triangles
Rectangular Pyramid	1	Rectangle	4	Triangles
Pentagonal Pyramid (5)	1	Pentagon	5	Triangles
Octagonal Pyramid (8)	1	Octagon	8	Triangles

A pyramid has 1 base polygon and as many triangles as the polygonal base has sides.

Aim: SWBAT calculate the actual and estimated surface area of prisms and pyramids.

Do Now: Calculate the actual and estimated area of the figure algebraically.

	Actual Area	Estimated Area
	$A = lw$ $A = (10.2)(9.4)$ $A = 95.88\ cm^2$	$A = lw$ $A \approx (10)(9)$ $A \approx 90\ cm^2$

Surface area is the total area of the surfaces of a 3-dimensionsal figure. (like wrapping a present).

The formula $SA = 2\mathcal{B} + \mathcal{P}h$ can be used to calculate surface area for all prisms.

$\mathcal{B}$ stands for the area of the base

$\mathcal{P}$ stands for the perimeter of the base

h stands for height of the prism

Specific formulas are also associated with certain prisms.

Surface of a Cube:

$SA = 6s^2$

Surface Area of a Rectangular Prism:

$SA = 2wl + 2lh + 2wh$

Surface Area of a Triangular Prism:

$SA = 2 \bullet (\text{area of triangular base}) + \text{Area of Rect}_1 + \text{Area of Rect}_2 + \text{Area of Rect}_3$

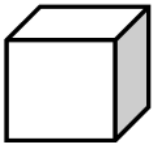
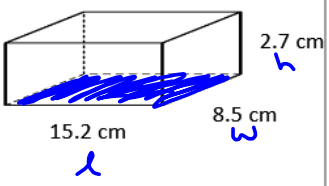
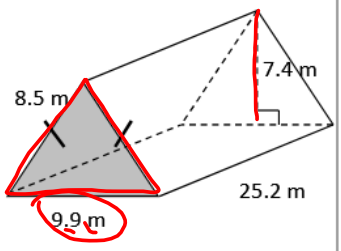
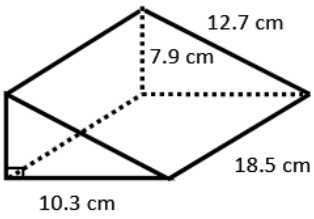
The formula $SA = \mathcal{B} + \frac{1}{2}\mathcal{P}l$ is used to calculate the surface area of pyramids.

$\mathcal{B}$ stands for the area of the base

$\mathcal{P}$ stands for the perimeter of the base

l stands for slant height

Find the exact and estimated surface area of each figure, algebraically.

	Actual Surface Area	Estimated Surface Area
 11.4 cm	$SA = 6s^2$ $SA = 6 \cdot (11.4)^2$ $SA = 779.76\ cm^2$	$SA = 6s^2$ $SA \approx 6 \cdot 11^2$ $SA \approx 726\ cm^2$
 2.7 cm (h) 15.2 cm (l) 8.5 cm (w)	$SA = 2wl + 2lh + 2wh$ $SA = 2(8.5)(15.2) + 2(15.2)(2.7) + 2(8.5)(2.7)$ $SA =$ + +	
 8.5 m 7.4 m 25.2 m 9.9 m	$SA = 2B + Ph$ $SA = 2\left(\frac{9.9 \cdot 7.4}{2}\right) + (8.5 + 8.5 + 9.9)($	
 12.7 cm 7.9 cm 18.5 cm 10.3 cm		