12.2/12.3 Surface Areas of Prisms, Cylinders, Pyramids and Cones

Target: Use properties of 3-D figures to solve problems

Lateral of a Prism

$L.A. = Ph$

Surface Area of a Prism

$S.A. = Ph + 2(Base\ Area)$

Lateral Area of a Cylinder

$L.A. = 2\pi rh$

Surface Area of a Cylinder

$S.A. = 2\pi rh + 2\pi r^2$

Lateral Area of a Regular Pyramid

$L.A. = \frac{Pl}{2}$

Surface Area of a Regular Pyramid

$S.A. = \frac{Pl}{2} + Base\ Area$

Lateral Area of a Cone

$L.A. = \pi rl$

Surface Area of a Cone

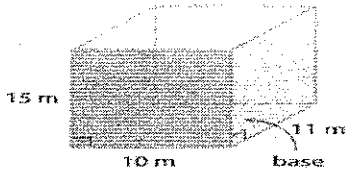
$S.A. = \pi rl + \pi r^2$

Surface Area of a Sphere

$S.A. = 4\pi r^2$

Find the lateral area and surface area of each prism.

1.



$LA = 42(5)$

$LA = 630m^2$

$SA = 630 + 2(110)$

$630 + 220$

$SA = 850m^2$

2.

$LA = 24(12)$

$LA = 288ft^2$

$SA = 288 + 2(24)$

$SA = 288 + 48$

$SA = 336ft^2$

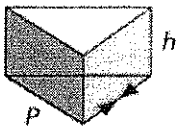
May 1, 2014

12.2/12.3 Surface Areas of Prisms, Cylinders, Pyramids and Cones

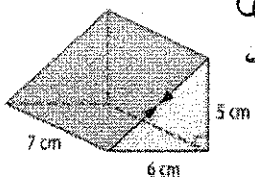
Target: Use properties of 3-D figures to find lateral area and surface area

Lateral Area of a Prism

$L.A. = Ph$



Find the lateral area of the prism. Round to the nearest tenth.



$6^2 + 5^2 = x^2$

$36 + 25 = x^2$

$x = 7.8$

$P = 7.8 + 6 + 5$

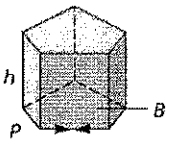
$P = 18.8 \text{ cm}$

$LA = 18.8(7)$

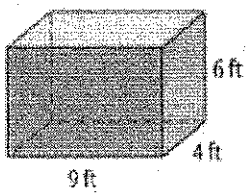
$LA = 131.6 \text{ cm}^2$

Surface Area of a Prism

$S.A. = L.A. + 2B$



Find the surface area of the rectangular prism.



$P = 4 + 9 + 4 + 9$

$P = 26$

$LA = 26(6)$

$LA = 156 \text{ ft}^2$

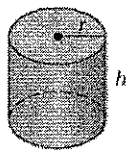
$SA = 156 + 2(9.4)$

$SA = 156 + 2(36)$

$SA = 228 \text{ ft}^2$

Lateral Area of a Cylinder

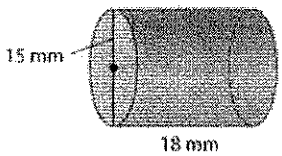
$L.A. = 2\pi rh$



$r = \frac{15}{2}$

$r = 7.5$

Find the lateral area of the cylinder. Round to the nearest tenth.

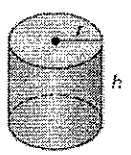


$LA = 2\pi(7.5)(18)$

$LA = 847.8 \text{ mm}^2$

Surface Area of a Cylinder

$S.A. = L.A. + 2\pi r^2$

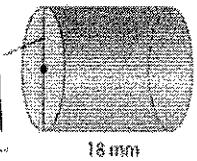


$LA = 2\pi(7.5)(18)$

$LA = 847.8 \text{ mm}^2$

$r = \frac{15}{2} = 7.5$

Find the surface area of the cylinder. Round to the nearest tenth.



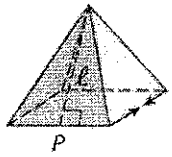
$SA = 2\pi(7.5)18$

$SA = 847.8 + 2\pi(7.5)^2$

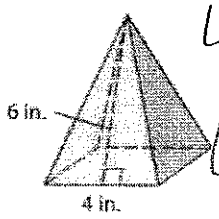
$SA = 1201.2 \text{ mm}^2$

Lateral Area of a Regular Pyramid

$$L.A. = \frac{Pl}{2}$$



Find the lateral area of the square pyramid.

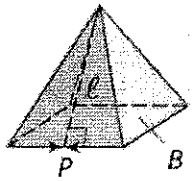


$L.A = \frac{16(6)}{2}$

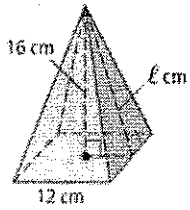
$L.A = 48 in^2$

Surface Area of a Regular Pyramid

$$S.A. = L.A. + B$$



Find the surface area of the square pyramid to the nearest tenth.



$16^2 + 6^2 = \ell^2$

$256 + 36 = \ell^2$

$\sqrt{292} = \sqrt{\ell^2}$

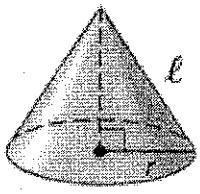
$\ell = 17.08$

$SA = 48 + \frac{(17.08)}{2} + 144$

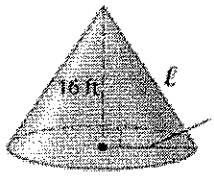
$SA = 553.92 cm^2$

Lateral Area of a Cone

$$L.A. = \pi r l$$



Find the lateral area.



$16^2 + 12^2 = \ell^2$

$256 + 144 = \ell^2$

$400 = \ell^2$

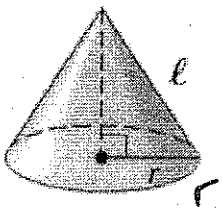
$\ell^2 = 20$

$L.A. = \pi(12)(20)$

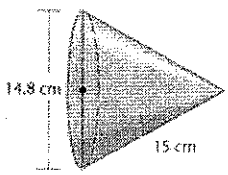
$L.A. = 753.98 ft^2$

Surface Area of a Cone

$$S.A. = L.A. + \pi r^2$$



Find the surface area of a cone with a diameter of 14.8 centimeters and a slant height of 15 centimeters.



$r = \frac{14.8}{2}$

$r = 7.4$

$S.A = \pi(7.4)15 + \pi(7.4^2)$

$= 348.71 + 172.03$

$SA = 520.7 cm^2$