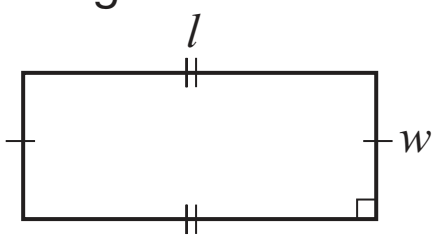
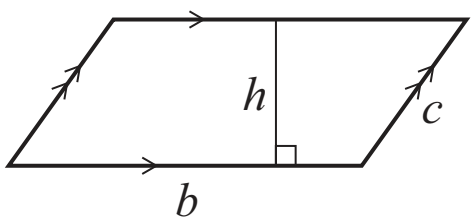
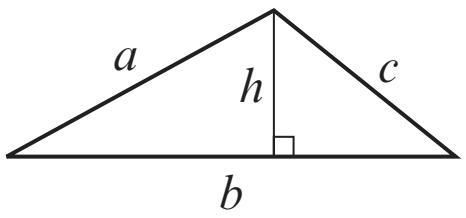
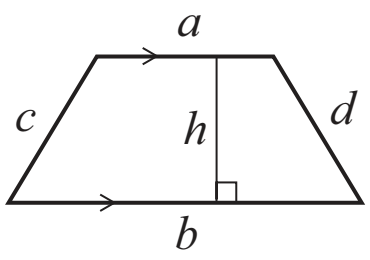
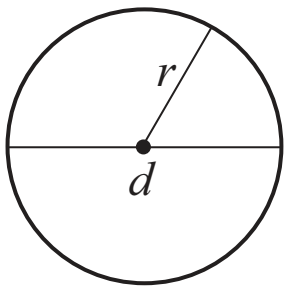
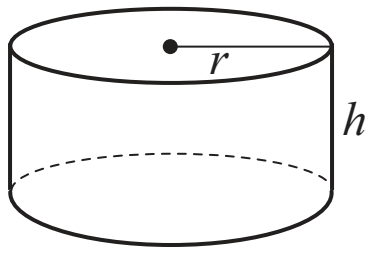
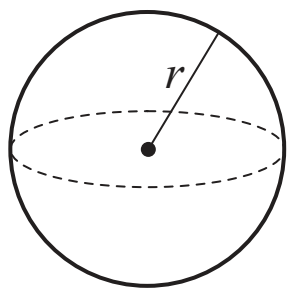
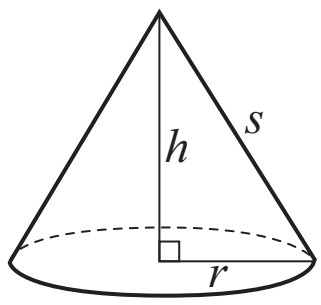
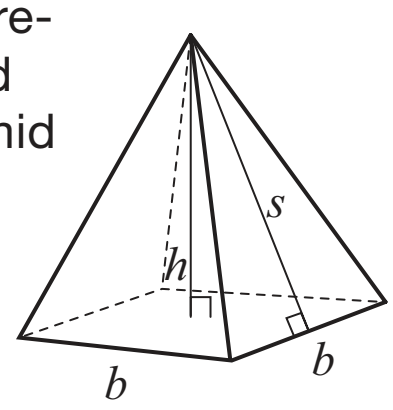
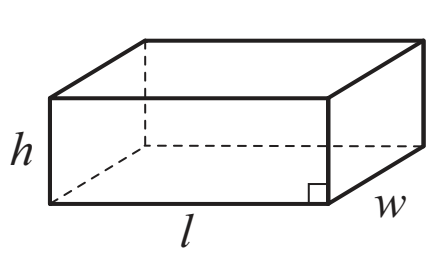
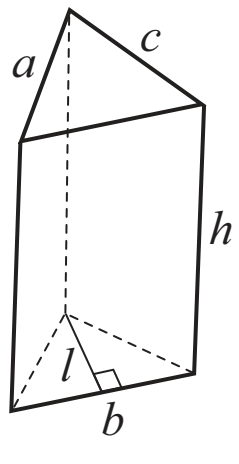
Formula Sheet
Grade 9 Academic

Geometric Shape	Perimeter	Area
Rectangle 	$P = l + l + w + w$ or $P = 2(l + w)$	$A = lw$
Parallelogram 	$P = b + b + c + c$ or $P = 2(b + c)$	$A = bh$
Triangle 	$P = a + b + c$	$A = \frac{bh}{2}$ or $A = \frac{1}{2}bh$
Trapezoid 	$P = a + b + c + d$	$A = \frac{(a + b)h}{2}$ or $A = \frac{1}{2}(a + b)h$
Circle 	$C = \pi d$ or $C = 2\pi r$	$A = \pi r^2$

Geometric Figure	Surface Area	Volume
Cylinder 	$A_{\text{base}} = \pi r^2$ $A_{\text{lateral surface}} = 2\pi rh$ $A_{\text{total}} = 2A_{\text{base}} + A_{\text{lateral surface}}$ $= 2\pi r^2 + 2\pi rh$	$V = (A_{\text{base}})(\text{height})$ $V = \pi r^2 h$
Sphere 	$A = 4\pi r^2$	$V = \frac{4\pi r^3}{3}$ or $V = \frac{4}{3}\pi r^3$
Cone 	$A_{\text{base}} = \pi r^2$ $A_{\text{lateral surface}} = \pi rs$ $A_{\text{total}} = A_{\text{base}} + A_{\text{lateral surface}}$ $= \pi r^2 + \pi rs$	$V = \frac{(A_{\text{base}})(\text{height})}{3}$ $V = \frac{\pi r^2 h}{3}$ or $V = \frac{1}{3}\pi r^2 h$
Square-based pyramid 	$A_{\text{base}} = b^2$ $A_{\text{triangle}} = \frac{bs}{2}$ $A_{\text{total}} = A_{\text{base}} + 4A_{\text{triangle}}$ $= b^2 + 2bs$	$V = \frac{(A_{\text{base}})(\text{height})}{3}$ $V = \frac{b^2 h}{3}$ or $V = \frac{1}{3}b^2 h$
Rectangular prism 	$A = 2(wh + lw + lh)$	$V = (A_{\text{base}})(\text{height})$ $V = lwh$
Triangular prism 	$A_{\text{base}} = \frac{bl}{2}$ $A_{\text{rectangles}} = ah + bh + ch$ $A_{\text{total}} = 2A_{\text{base}} + A_{\text{rectangles}}$ $= bl + ah + bh + ch$	$V = (A_{\text{base}})(\text{height})$ $V = \frac{blh}{2}$ or $V = \frac{1}{2}blh$