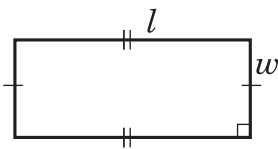
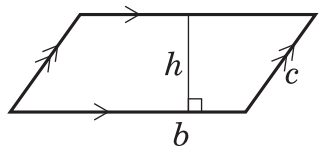
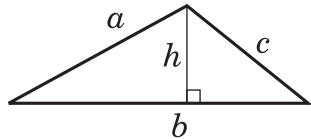
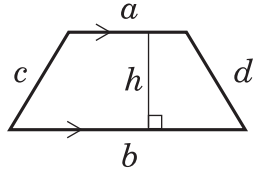
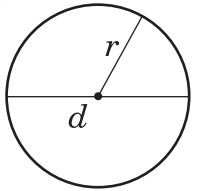
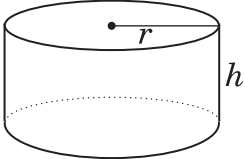
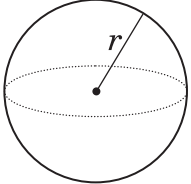
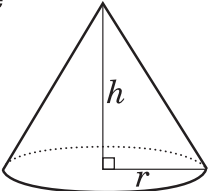
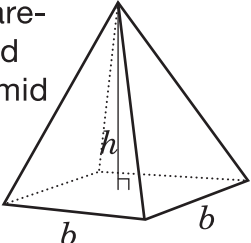
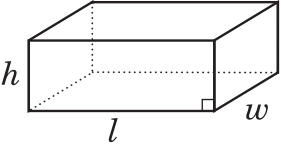
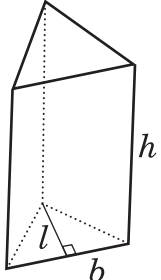


# Formula Sheet

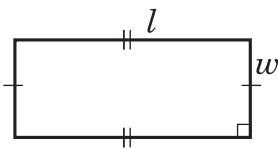
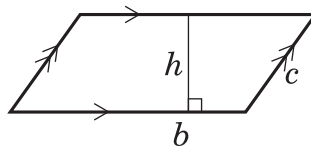
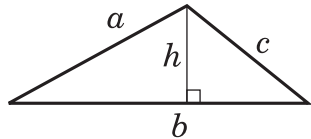
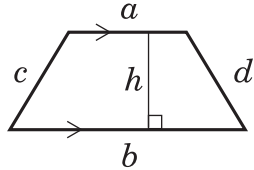
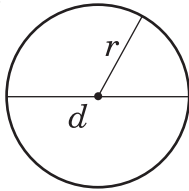
## Grade 9 Applied

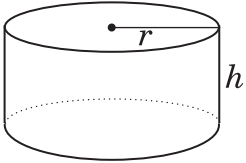
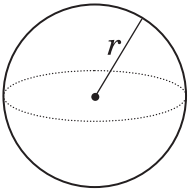
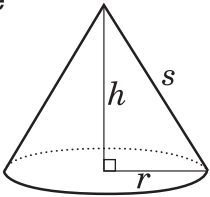
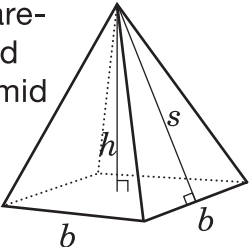
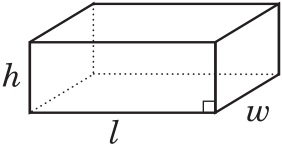
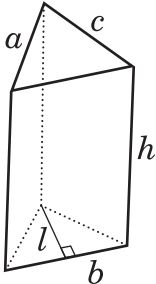
Geometric Figure	Perimeter	Area
<p>Rectangle</p> 	$P = l + l + w + w$ or $P = 2(l + w)$	$A = lw$
<p>Parallelogram</p> 	$P = b + b + c + c$ or $P = 2(b + c)$	$A = bh$
<p>Triangle</p> 	$P = a + b + c$	$A = \frac{bh}{2}$ or $A = \frac{1}{2}bh$
<p>Trapezoid</p> 	$P = a + b + c + d$	$A = \frac{(a + b)h}{2}$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

Geometric Figure	Volume
Cylinder 	$V = (\text{area of base})(\text{height})$  $V = \pi r^2 h$
Sphere 	$V = \frac{4}{3} \pi r^3$ or $V = \frac{4\pi r^3}{3}$
Cone 	$V = \frac{(\text{area of base})(\text{height})}{3}$  $V = \frac{1}{3} \pi r^2 h$ or $V = \frac{\pi r^2 h}{3}$
Square-based pyramid 	$V = \frac{(\text{area of base})(\text{height})}{3}$  $V = \frac{1}{3} b^2 h$ or $V = \frac{b^2 h}{3}$
Rectangular prism 	$V = (\text{area of base})(\text{height})$  $V = lwh$
Triangular prism 	$V = (\text{area of base})(\text{height})$  $V = \frac{1}{2} blh$ or $V = \frac{blh}{2}$

# Formula Sheet

## Grade 9 Academic

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

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