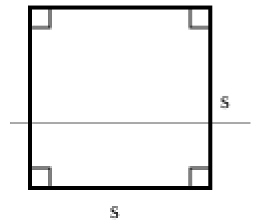
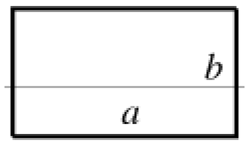
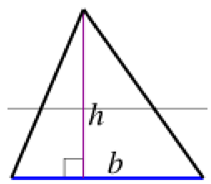
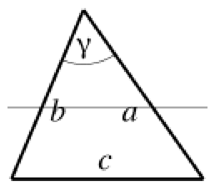
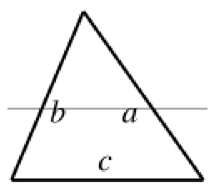
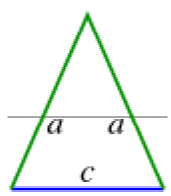
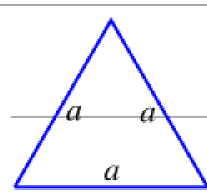
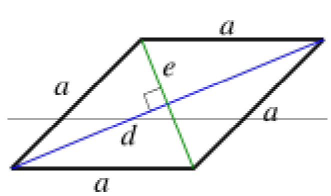
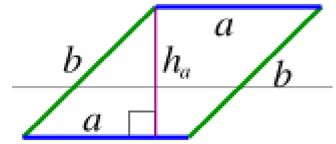
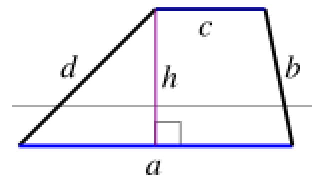
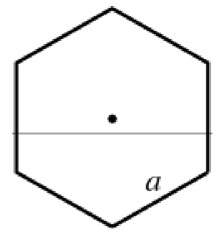
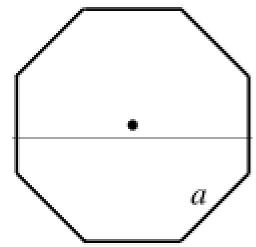
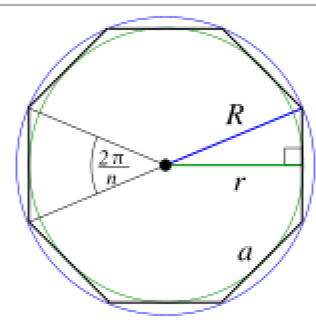
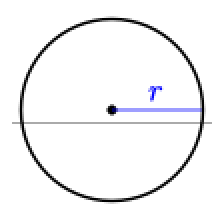
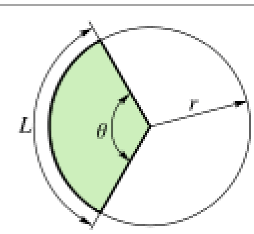
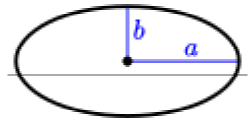
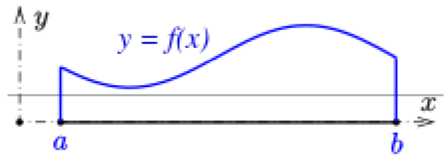
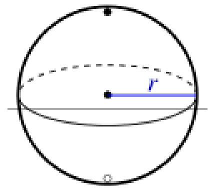
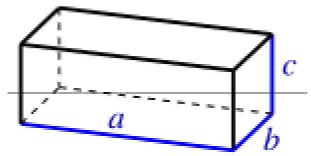
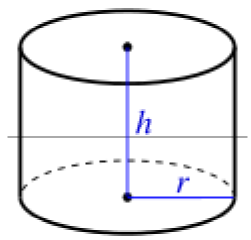
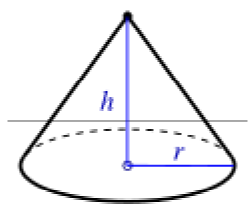
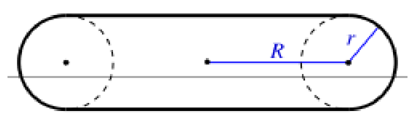
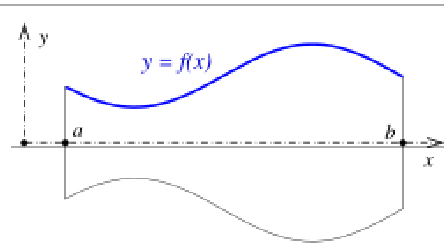
List of formulas

Additional common formulas for area:

Shape	Formula	Variables
Square	$A = s^2$	
Rectangle	$A = ab$	
Triangle	$A = \frac{1}{2}bh$	
Triangle	$A = \frac{1}{2}ab\sin(\gamma)$	
Triangle (Heron's formula)	$A = \sqrt{s(s-a)(s-b)(s-c)}$	 $s = \frac{1}{2}(a+b+c)$
Isosceles triangle	$A = \frac{c}{4}\sqrt{4a^2 - c^2}$	
Regular triangle (equilateral triangle)	$A = \frac{\sqrt{3}}{4}a^2$	
Rhombus/Kite	$A = \frac{1}{2}de$	

Parallelogram	$A = ah_a$	
Trapezoid	$A = \dfrac{(a+c)h}{2}$	
Regular hexagon	$A = \dfrac{3}{2}\sqrt{3}a^2$	
Regular octagon	$A = 2(1+\sqrt{2})a^2$	
Regular polygon (n sides)	$\begin{aligned} A &= n\frac{ar}{2} = \frac{pr}{2} \\ &= \tfrac{1}{4}na^2\cot(\tfrac{\pi}{n}) \\ &= nr^2\tan(\tfrac{\pi}{n}) \\ &= \tfrac{1}{4n}p^2\cot(\tfrac{\pi}{n}) \\ &= \tfrac{1}{2}nR^2\sin(\tfrac{2\pi}{n}) \end{aligned}$	 $p = na$ (perimeter) $r = \tfrac{a}{2}\cot(\tfrac{\pi}{n}),$ $\tfrac{a}{2} = r\tan(\tfrac{\pi}{n}) = R\sin(\tfrac{\pi}{n})$ r : incircle radius R : circumcircle radius
Circle	$A = \pi r^2 = \dfrac{\pi d^2}{4}$ ($d = 2r$: diameter)	
Circular sector	$A = \dfrac{\theta}{2}r^2 = \dfrac{L \cdot r}{2}$	

Ellipse	$A = \pi ab$	
Integral	$A = \int_a^b f(x)\mathrm{d}x,\ f(x) \geq 0$	
	Surface area	
Sphere	$A = 4\pi r^2 = \pi d^2$	
Cuboid	$A = 2(ab + ac + bc)$	
Cylinder (incl. bottom and top)	$A = 2\pi r(r + h)$	
Cone (incl. bottom)	$A = \pi r(r + \sqrt{r^2 + h^2})$	
Torus	$A = 4\pi^2 \cdot R \cdot r$	
Surface of revolution	$A = 2\pi \int_a^b f(x)\sqrt{1 + [f'(x)]^2}\mathrm{d}x$ (rotation around the x-axis)	

The above calculations show how to find the areas of many common shapes.

The areas of irregular (and thus arbitrary) polygons can be calculated using the "Surveyor's formula" (shoelace formula).[28]