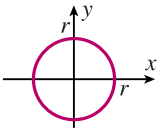
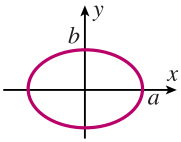
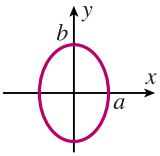
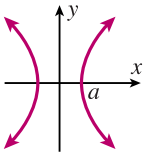
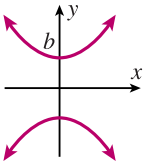
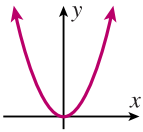
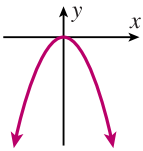
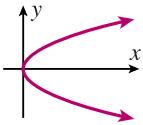
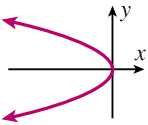
Description of conic	Standard form of equation	Graph
circle	$x^2 + y^2 = r^2$	
ellipse	$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$	
(a) major axis on x-axis ("wide and short")	$(a > b)$	
(b) major axis on y-axis ("tall and narrow")	$(a < b)$	
hyperbola		
(a) transverse axis on x-axis (opens left and right)	$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$	
(b) transverse axis on y-axis (opens up and down)	$\frac{y^2}{b^2} - \frac{x^2}{a^2} = 1$	
parabola		
(a) opens up	$y = ax^2$ $(a > 0)$	
(b) opens down	$y = ax^2$ $(a < 0)$	
(c) opens right	$x = ay^2$ $(a > 0)$	
(d) opens left	$x = ay^2$ $(a < 0)$