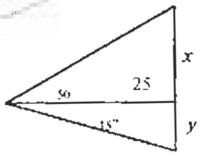
20.1 Right-Triangle Trigonometry: The Definitions

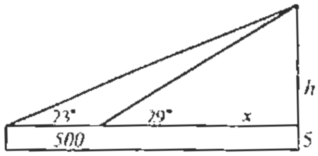
1.

	(a)	(b)	(c)
$\sin\theta$	$\frac{4}{5}$	$\frac{Q}{\sqrt{1+Q^2}}$	$\frac{\sqrt{R^2-1}}{R}$
$\cos\theta$	$\frac{3}{5}$	$\frac{1}{\sqrt{1+Q^2}}$	$\frac{1}{R}$
$\tan\theta$	$\frac{4}{3}$	Q	$\sqrt{R^2-1}$
$\csc\theta$	$\frac{5}{4}$	$\frac{\sqrt{1+Q^2}}{Q}$	$\frac{R}{\sqrt{R^2-1}}$
$\sec\theta$	$\frac{5}{3}$	$\sqrt{1+Q^2}$	R
$\cot\theta$	$\frac{3}{4}$	$\frac{1}{Q}$	$\frac{1}{\sqrt{R^2-1}}$

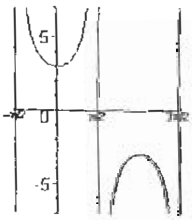
4. $\tan(50^\circ) = \frac{x}{25} \Rightarrow x = 25\tan(50^\circ) \approx 29.8\,ft$
$\tan(15^\circ) = \frac{y}{25} \Rightarrow y = 25\tan(15^\circ) \approx 6.7\,ft$
height approx. $36.5\,ft$



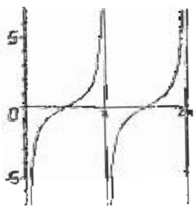
6. $\tan(29^\circ) = \frac{h}{x} \Rightarrow x\tan(29^\circ) = h$,
$\tan(23^\circ) = \frac{h}{500+x} \Rightarrow (500+x)\tan(23^\circ) = h$
equate h's and solving for x gives $x \approx 1635\,ft$
so $h \approx 906\,ft$, hence the building height is ≈ 911



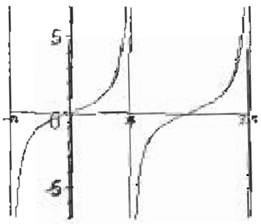
7. (a) $y = 3\sec x$



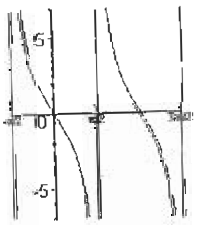
(b) $y = -\cot x$



(c) $y = \tan(\frac{x}{2})$



(d) $y = -3\tan x$



(e) $y = 2\csc x$