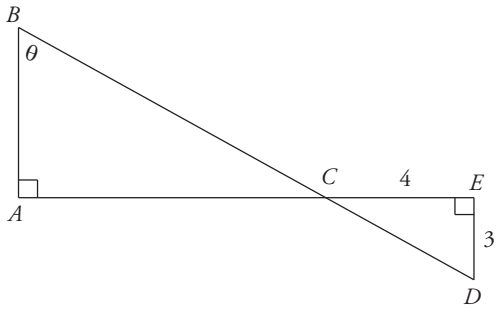
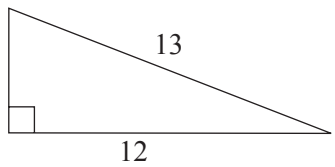
Comprehensive Trigonometry Drill

The answers can be found in Part IV.



7. In the figure above, if $\overline{CE} = 4$ and $\overline{DE} = 3$, then what is the value of $\sin\theta$?

   (A) 0.014
   (B) 0.6
   (C) 0.75
   (D) 0.8
   (E) 1.333

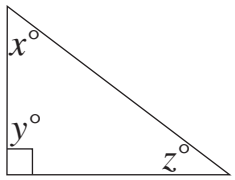


10. If x is the smallest angle in the triangle above, then what is the value of $\sec x$?

   (A) $\frac{13}{12}$
   (B) $\frac{13}{5}$
   (C) $\frac{12}{5}$
   (D) $\frac{12}{13}$
   (E) $\frac{5}{12}$

13. If $(1-\sin x)(1+\sin x) = 0.165$, then what is the value of $\tan^2 x$?

   (A) 0.198
   (B) 0.835
   (C) 1.517
   (D) 2.303
   (E) 5.061

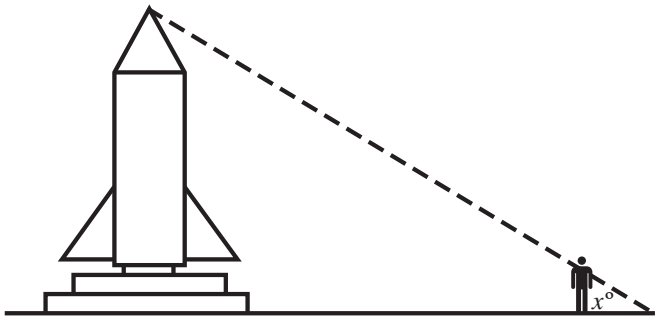


Note: Figure not drawn to scale.

20. In the figure above, which of the following must be true?

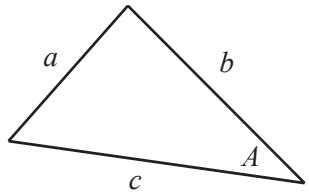
   I. $\sec x = \csc z$
   II. $x = z$
   III. $\sin x < \tan x$

   (A) I only
   (B) II only
   (C) I and III only
   (D) II and III only
   (E) I, II, and III



25. Carl (pictured above) is standing near a rocket. Carl's eyes are 1.6 m above ground level. If the rocket's tip is 150 m above the ground, the minimum safe distance from the rocket when it launches is 500 m, and a line which passes from the ground, through Carl's eye, and to the tip of the rocket creates an angle of x degrees with the ground, then what is the value of x which ensures that Carl is a safe distance from the rocket?

(A) 0.005
(B) 0.999
(C) 16.531
(D) 16.669
(E) 16.867



34. In the triangle above, if $a = \sqrt{20}$, $b = 7$, and $c = 9$, then what is the value of sec A ?

(A) 0.488
(B) 0.873
(C) 1.145
(D) 2.050
(E) 29.189

35. If $0 \le x \le \pi$, then for what value of x does

$\sin\left(x + \frac{\pi}{6}\right) = \cos x$?

(A) 0
(B) $\frac{\pi}{6}$
(C) $\frac{\pi}{4}$
(D) $\frac{5\pi}{6}$
(E) π

40. (–8, 6) in the xy-coordinate system is equal to which of the following polar coordinates?

(A) (–0.644, 10)
(B) (10, 2.214)
(C) (10, –0.644)
(D) (–10, 0.644)
(E) (–10, 5.640)

45. If $\csc \theta = -1.556$ and $-90^\circ \le \theta \le 90^\circ$, then which of the following could be the value of $\cos \theta$?

(A) –0.766
(B) –0.643
(C) 0.643
(D) 0.766
(E) 1.556

47. If $\sin^2\left(\frac{\pi}{x}\right) + \sin^2\left(\frac{\pi}{y}\right) + \sin^2\left(\frac{\pi}{z}\right) = 2.345$, then

$\cos^2\left(\frac{\pi}{x}\right) + \cos^2\left(\frac{\pi}{y}\right) + \cos^2\left(\frac{\pi}{z}\right) =$

(A) –2.345
(B) –0.655
(C) 0.655
(D) 0.809
(E) 2.345

48. If $\frac{\pi}{2} < x < \pi$ and $\sin x = 0.782$, then what is

$\cos 3x$?

(A) –1.870
(B) –0.901
(C) 0.705
(D) 0.789
(E) 0.901