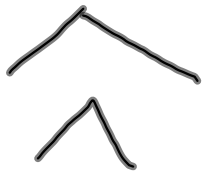
§1.8 Pick 3 probs

1 from #s 20-30

1 from #s 31-40

1 from #s 41-46, 57-59



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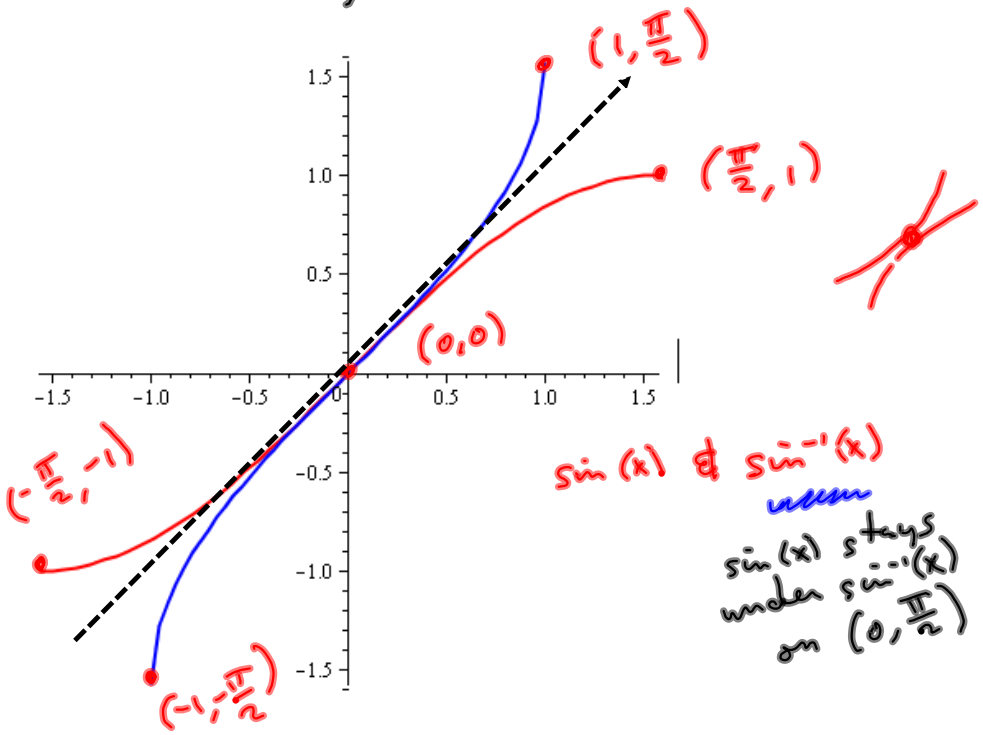
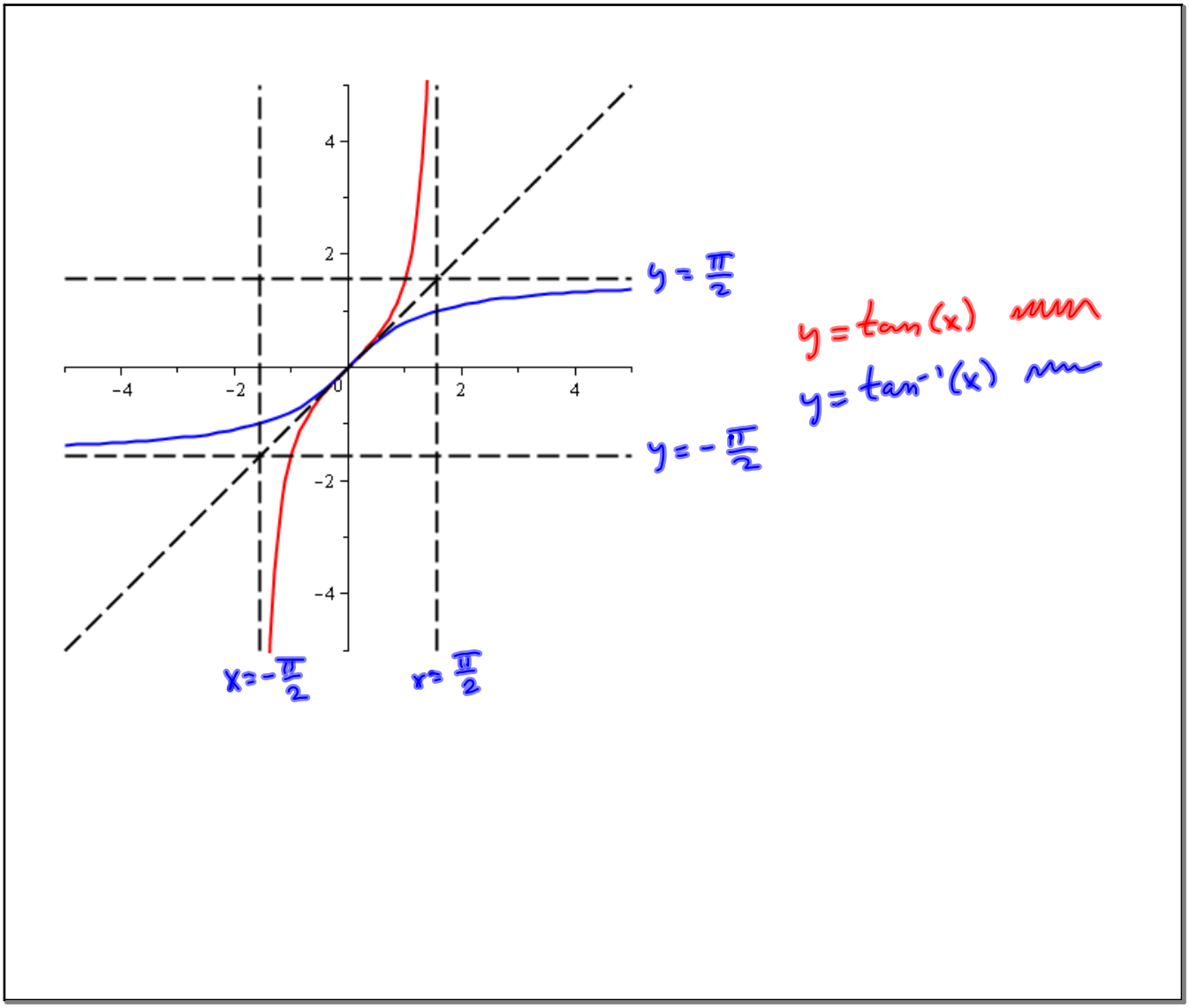
§1.7 #106 "Angle of Repose"



sin(x) & sin⁻¹(x)

sin(x) stays under sin⁻¹(x) on (0, π/2)

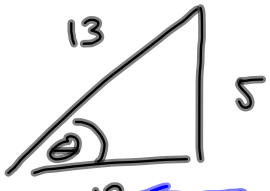

4
2
-4
-2
0
2
4
-2
-4
$y = \frac{\pi}{2}$
$y = -\frac{\pi}{2}$
$x = -\frac{\pi}{2}$
$x = \frac{\pi}{2}$
$y = \tan(x)$
$y = \tan^{-1}(x)$

Feb 26-8:20 AM

5.1.7 # 57, 61

$\cos\left(\underbrace{\arcsin\left(\frac{5}{13}\right)}_{\theta}\right)$

$= \frac{12}{13}$



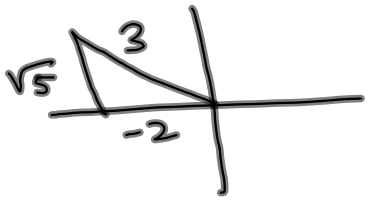
12 ← is correct.

$169 + 25 = 194$

$\sqrt{194}$ was my error.

$\sin\left(\arccos\left(-\frac{2}{3}\right)\right)$

$= \frac{\sqrt{5}}{3}$

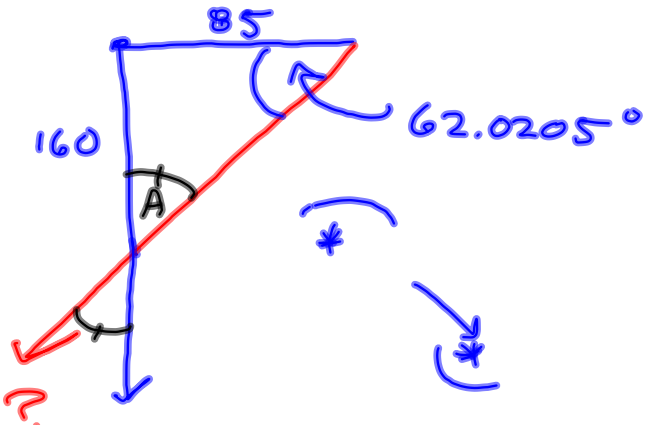


S1.8 #40

160 mi N

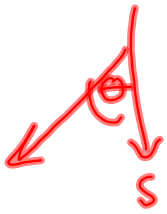
85 mi E

wants to fly straight to airport



Typically measure the acute angle from due North. (or due South)

This example it'll be so many degrees West of South



$\arctan\left(\frac{160}{85}\right)$

≈ 62.02052562°

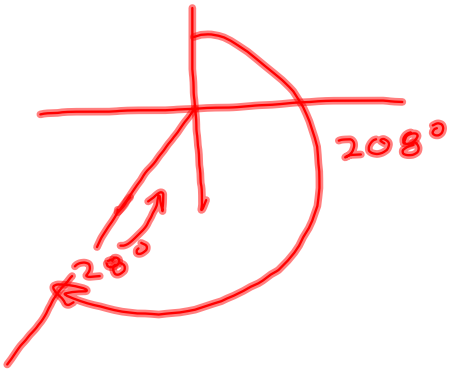
is complement to the angle A

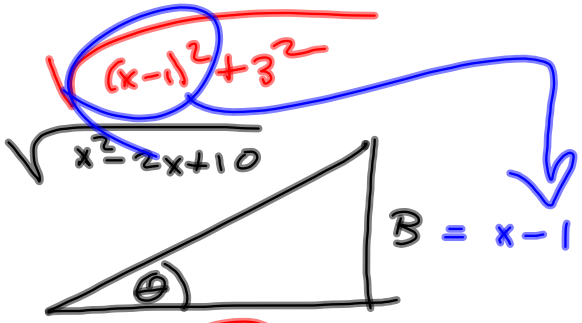
& A = the bearing (west of South)

$90° - 62.02052562 = 27.9794744$

So, about South 28° West.

Book answer is 208°, which is measured clockwise from due North.





$$B = \sqrt{\sqrt{x^2-2x+10}^2 - 3^2}$$

$$= \sqrt{x^2-2x+1} = \boxed{\sqrt{(x-1)^2} = |x-1|}$$

$$\sqrt{(-3)^2} = 3$$

& we assume all lengths are positive, so it's $x-1$.

$$\frac{3}{\sqrt{x^2-2x+10}}$$

$$= -\frac{3}{\sqrt{x^2-2x+1^2-1+10}}$$

$$= -\frac{3}{\sqrt{(x-1)^2+3^2}}$$

I completed the square and "saw"

$a^2+b^2=c^2$

$3^2 + (x-1)^2 = x^2-2x+10$

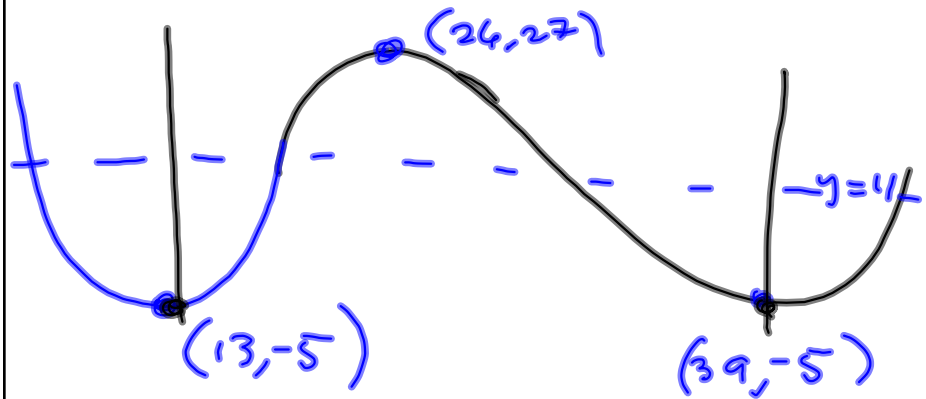
$= (x-1)^2+3^2$

Want to build a function.

Low point is -5 @ $x = 13$

High point is 27 @ $x = 26$

It's periodic.



$y = \frac{27-5}{2} = 11$

$\frac{27-(-5)}{2} = 16$

$T = 39 - 13 = 26$

Want

$bx = 2\pi$ when $x = 26$

$26b = 2\pi$

$b = \frac{2\pi}{26} = \frac{\pi}{13}$ $\cos\left(\frac{\pi}{13}x\right)$

$\cos(bx)$ has period what?

Solve $bx = 2\pi$

$x = \frac{2\pi}{b} = T$

$\cos\left(\frac{\pi}{13}x\right) + 11$

Amplitude: 16

$16\cos\left(\frac{\pi}{13}x\right) + 11$

High Point @ $x = 26$

$16\cos\left(\frac{\pi}{13}(x-26)\right) + 11$