2.5 17. Simplify. Express the answer in a + bi form.

$\frac{(2+3i)(1+2i)}{(1-2i)(1+2i)} = \frac{2+4i+3i+6i^2}{\ldots} \quad \frac{2+7i-6}{\ldots} = \frac{-4+7i}{5} = \boxed{\frac{-4}{5}+\frac{7}{5}i}$

Pre Calculus B
Exam Review
ANSWERS

Highlighted questions are on your review.

2.7 Find (if it exists) the a) as ... ction. Be sure to list any holes.

18. $g(x) = \frac{x^2-9}{2x^2-x-15} =$ ... here $x-3=0\ldots$ 3 $g(3) = \frac{3+3}{2\cdot3+5} = \frac{6}{11}$ $\boxed{\text{Hole: } (3, 6/11)}$

a) HA: $\frac{x^2}{2x^2} = \frac{1}{2}$

VA: $2x+5=0$

$\boxed{x=\frac{-5}{2}}$

$= \frac{3}{5}$

$\boxed{(0, 3/5)}$

c) Domain: $\boxed{(-\infty,-\frac{5}{2})\cup(-\frac{5}{2},3)\cup(3,\infty)}$

3.3 19. Simplify each expression.

(a) $\log_5 1 = \boxed{0}$

b/c $5^0 = 1$

(b) $\log \sqrt[4]{10} = x$

$10^x = \sqrt[4]{10}$

$10^x = 10^{1/4}$

$x = \boxed{\frac{1}{4}}$

(c) $3^{\log_3 7} = \boxed{7}$

3.4 20. Expand each logarithm:

(a) $\log_2\left(\frac{8\sqrt[5]{x}}{y}\right)$

$\log_2 8 + \log_2 x^{1/5} - \log_2 y$

$\boxed{3+\frac{1}{5}\log_2 x - \log_2 y}$

(b) $\log\left(\frac{\sqrt{x^5}}{10}\right)$

$\log x^{5/2} - \log 10$

$\boxed{\frac{5}{2}\log x - 1}$

(c) $\ln(6x^4e^3)$

$\ln 6 + \ln x^4 + \ln e^3$

$\boxed{\ln 6 + 4\ln x + 3}$

Calculator Allowed.

loose 3% keep 97%

3.2 21. A radioactive isotope decays at a rate of 3% per day. A scientist has an initial amount of 50 g. Write a model for this situation. Determine approximately how many days it will take for half the isotope to decay.

$y = 50(0.97)^x$ where x = # of days, y = amount of isotope

$25 = 50(0.97)^x$

$0.5 = (0.97)^x$

$\log 0.5 = \log(0.97)^x$

$\log 0.5 = x \cdot \log 0.97$

$\frac{\log 0.5}{\log 0.97} = x$

$\boxed{x = 22.757 \text{ days}}$

3.5 22. Solve algebraically:

(a) $\log_3 x + \log_3(x+8) = 2$

$\log_3[x(x+8)] = 2$

$3^2 = x(x+8)$

$9 = x^2 + 8x$

$0 = x^2 + 8x - 9$

$(x+9)(x-1) = 0$

$x+9=0 \quad x-1=0$

$\cancel{x=-9} \quad \boxed{x=1}$

Not in domain

(b) $\log_2(x+5) - \log_2 x = 7$

$\log_2\left(\frac{x+5}{x}\right) = 7$

$2^7 = \frac{x+5}{x}$

$\frac{128}{1} = \frac{x+5}{x}$

$128x = x+5$

$127x = 5$

$\boxed{x = \frac{5}{127}}$

(c) $3^{\frac{x}{2}} - 6 = 42$

$3^{\frac{x}{2}} = 48$

$\log(3)^{\frac{x}{2}} = \log 48$

$\frac{x}{2}\cdot\log 3 = \log 48$

$x\cdot\log 3 = 2\log 48$

$x = \frac{2\log 48}{\log 3}$

$\boxed{x = 7.047}$

(d) $-27 = -3\cdot\left(\frac{1}{4}\right)^{6x}$

$9 = \left(\frac{1}{4}\right)^{6x}$

$\log 9 = \log\left(\frac{1}{4}\right)^{6x}$

$\log 9 = 6x\cdot\log\left(\frac{1}{4}\right)$

$\frac{\log 9}{6\log\left(\frac{1}{4}\right)} = x$

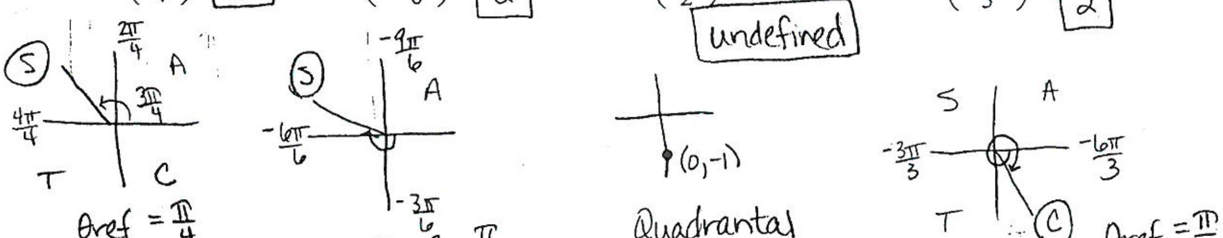
$\boxed{-.264 = x}$

	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$
S	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
C	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$
T	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$

Ch. 4, Ch. 5, 9.2, 9.4, 6.1and 6.3 (2nd Semester) ~ No Calculator

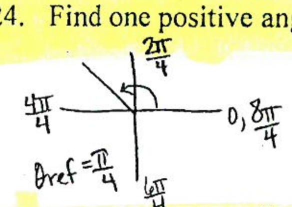
4.2
4.3 23. Find each exact value.

(a) $\cos\left(\frac{3\pi}{4}\right) = \boxed{\frac{-\sqrt{2}}{2}}$ (b) $\sin\left(-\frac{7\pi}{6}\right) = \boxed{\frac{1}{2}}$ (c) $\tan\left(\frac{3\pi}{2}\right) = \frac{-1}{0}$ $\boxed{\text{undefined}}$ (d) $\cos\left(\frac{-7\pi}{3}\right) = \boxed{\frac{1}{2}}$



$\theta ref = \frac{\pi}{4}$ $\quad \theta ref = \frac{\pi}{6}$ $\quad$ Quadrantal $\quad \theta ref = \frac{\pi}{3}$

4.3 24. Find one positive angle and one negative angle that are coterminal with: $\frac{3\pi}{4}$.

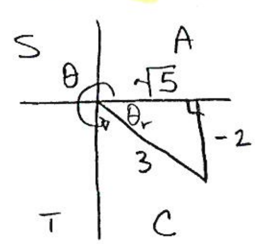


$\theta ref = \frac{\pi}{4}$

pos: $\frac{3\pi}{4} + \frac{8\pi}{4} = \frac{11\pi}{4}$

neg: $\frac{3\pi}{4} - \frac{8\pi}{4} = \frac{-5\pi}{4}$

4.3 25. Given: $\sin\theta = -\frac{2}{3}$ and $\underbrace{\cos\theta > 0}_{\text{pos}}$. Find the values of the remaining five trigonometric functions of θ.



$\cos\theta = \frac{\sqrt{5}}{3}$ $\quad \csc\theta = \frac{-3}{2}$

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

$\tan\theta = \frac{-2}{\sqrt{5}}$ $\quad \cot\theta = \frac{\sqrt{5}}{-2}$

$(-2)^2 + b^2 = 3^2$

$b^2 = 9 - 4$

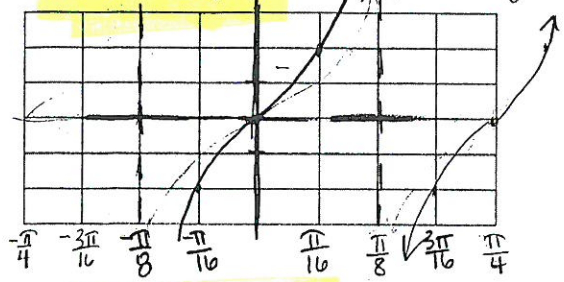
$b = \sqrt{5}$

4.4 26. State the amplitude, period, phase shift, and vertical shift, and then graph each function. Clearly label all tick marks on the axes.

vert. stretch 2

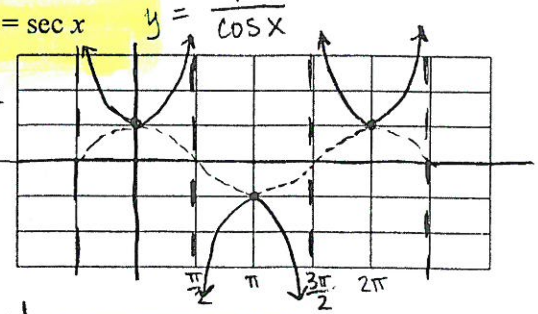
(a) $y = 2\tan(4x)$ VA: $x = \pm\frac{\pi}{8}$

amp: n/a
per: $\frac{\pi}{4}$
ps: 0
vs: 0



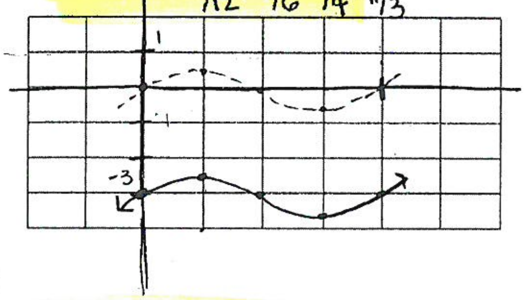
(b) $y = \sec x$ $y = \frac{1}{\cos x}$

amp: n/a
per: 2π
ps: 0
vs: 0



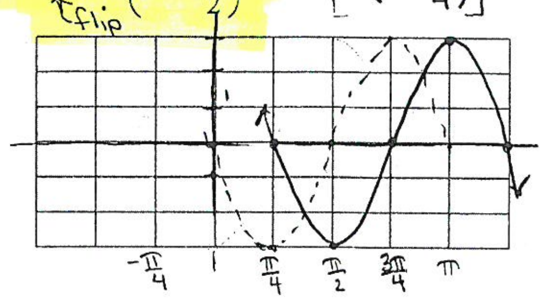
(c) $y = \frac{1}{2}\sin(6x) - 3$ $\pi/12$ $\pi/6$ $\pi/4$ $\pi/3$

amp: $\frac{1}{2}$
per: $\frac{\pi}{3}$
ps: 0
vs: -3



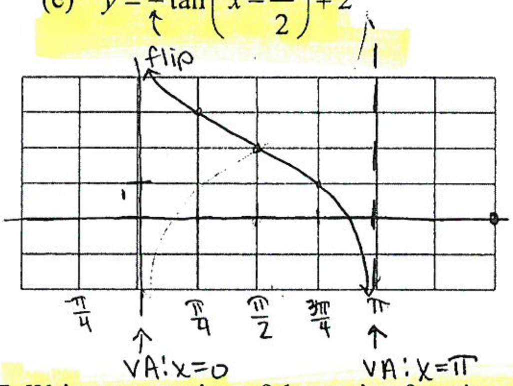
often missed
* (d) $y = -3\sin\left(2x - \frac{\pi}{2}\right) = -3\left[2\left(x - \frac{\pi}{4}\right)\right]$
flip

amp: 3
per: π
ps: $\frac{\pi}{4}$
vs: 0



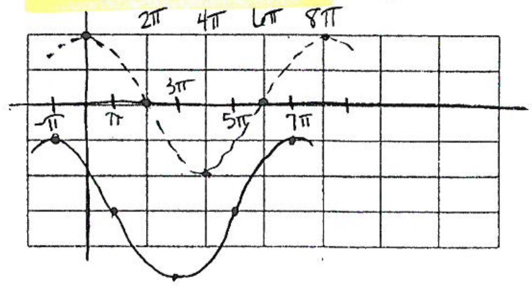
(e) $y = -\tan\left(x - \frac{\pi}{2}\right) + 2$
flip

amp: n/a
per: π
ps: $\frac{\pi}{2}$
vs: 2



often missed
* (f) $y = 2\cos\left(\frac{1}{4}x + \frac{\pi}{4}\right) - 3 = 2\cos\left[\frac{1}{4}(x+\pi)\right] - 3$

amp: 2
per: 8π
ps: $-\pi$
vs: -3

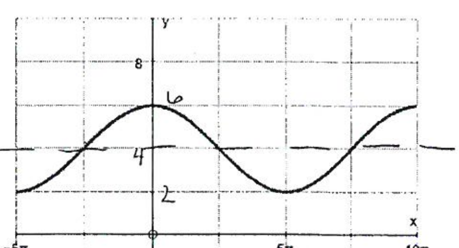


4.4 27. Write an equation of the cosine function with amplitude = 2, period = $\frac{\pi}{2}$, phase shift = $-\frac{\pi}{8}$ and vertical shift = – 3.

$y = 2\cos\left[4\left(x + \frac{\pi}{8}\right)\right] - 3$

per: $\frac{\pi}{2}$ $\frac{\pi}{2} = \frac{2\pi}{b}$
$\pi b = 4\pi$
$b = 4$

4.4 28. Use the given graph…



5.3 (a) Write a sine function that fits the graph.

ps: $-\frac{5\pi}{2}$ $y = 2\sin\left[\frac{1}{5}\left(x + \frac{5\pi}{2}\right)\right] + 4$

(b) Write a cosine function that fits the graph.

ps: 0 $y = 2\cos\left(\frac{1}{5}x\right) + 4$

amp: 2 per: 10π $\frac{2\pi}{b} = \frac{10\pi}{1}$
vs: 4 $10\pi b = 2\pi$
$b = \frac{1}{5}$

(c) Using identities, prove that the two equations you wrote are equal.

$2\sin\left[\frac{1}{5}\left(x + \frac{5\pi}{2}\right)\right] + 4 = 2\cos\left(\frac{1}{5}x\right) + 4$

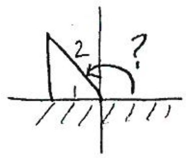
$LS \rightarrow 2\sin\left(\frac{1}{5}x + \frac{\pi}{2}\right) + 4$

$= 2\left[\sin\left(\frac{1}{5}x\right)\cancel{\cos\left(\frac{\pi}{2}\right)}^{0} + \cos\left(\frac{1}{5}x\right)\cancel{\sin\left(\frac{\pi}{2}\right)}^{1}\right] + 4 = 2\cos\left(\frac{1}{5}x\right) + 4 \rightarrow RS✓$

4.7 29. Find each value. *Remember the domain restrictions for inverse trig. functions

(a) $\arccos\left(\frac{1}{\sqrt{2}}\right) = \boxed{\frac{\pi}{4}}$

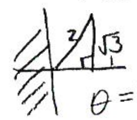
(b) $\cos^{-1}\left(-\frac{1}{2}\right) = \boxed{\frac{2\pi}{3}}$



$\theta ref = \frac{\pi}{3}$

(c) $\sec\left[\underbrace{\sin^{-1}\left(\frac{\sqrt{3}}{2}\right)}\right] = \sec\left(\frac{\pi}{3}\right)$

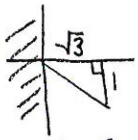
$= \boxed{\frac{2}{1}}$



$\theta = \frac{\pi}{3}$

(d) $\sin\left[\underbrace{\tan^{-1}\left(-\frac{\sqrt{3}}{3}\right)}\right] = \sin\left(-\frac{\pi}{6}\right)$

$= \boxed{\frac{-1}{2}}$



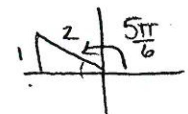
$\theta ref = \frac{\pi}{6}$

(e) $\cos[\underbrace{\arcsin(-1)}]$

$\theta = -\frac{\pi}{2}$

$\cos\left(-\frac{\pi}{2}\right) = \boxed{0}$

(f) $\sin^{-1}\left[\underbrace{\sin\left(\frac{5\pi}{6}\right)}\right] = \underbrace{\sin^{-1}\left(\frac{1}{2}\right)}$



$\theta ref = \frac{\pi}{6}$

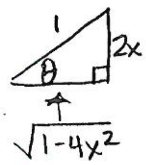
*Notice domain

$\theta = \boxed{\frac{\pi}{6}}$

4.7 30. Write an algebraic expression equivalent to each expression below. *Hint:* Draw a Δ.

(a) $\tan(\underbrace{\sin^{-1} 2x})$

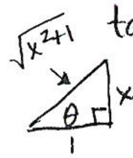
Find angle θ where $\sin\theta = 2x$...



$\tan\theta = \boxed{\frac{2x}{\sqrt{1-4x^2}}}$

(b) $\sec\left(\underbrace{\tan^{-1} x}\right)$

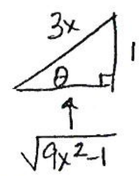
Find angle θ where $\tan\theta = x$...



$\sec\theta = \boxed{\frac{\sqrt{x^2+1}}{1}}$

(c) $\cot\left(\underbrace{\csc^{-1} 3x}\right)$

Find θ where $\csc\theta = 3x$ or where $\sin\theta = \frac{1}{3x}$.



$\cot\theta = \boxed{\frac{\sqrt{9x^2-1}}{1}}$

5.1-5.4 Verify that each of the following is an identity. Be sure to show all steps.

31. $\sin^2\theta\left(\csc^2\theta - 1\right) + \tan(-\theta)\cos\theta + \cos\left(\frac{\pi}{2} - \theta\right) = \cos^2\theta$

LS → $\sin^2\theta \cdot \cot^2\theta - \tan\theta \cdot \cos\theta + \sin\theta$

$= \sin^2\theta \cdot \frac{\cos^2\theta}{\sin^2\theta} - \frac{\sin\theta}{\cos\theta} \cdot \cos\theta + \sin\theta$

$= \cos^2\theta - \sin\theta + \sin\theta$

$= \cos^2\theta$ → RS

32. $\frac{\sin\beta}{\csc\beta} + \frac{\cos\beta}{\sec\beta} = 1$

LS → $\frac{\sin\beta}{\frac{1}{\sin\beta}} + \frac{\cos\beta}{\frac{1}{\cos\beta}}$

$= \sin\beta \cdot \frac{\sin\beta}{1} + \cos\beta \cdot \frac{\cos\beta}{1}$

$= \sin^2\beta + \cos^2\beta$

$= 1$ → RS

33. $\frac{2\tan x}{1 + \tan^2 x} = \sin 2x$

LS → $\frac{2\tan x}{\sec^2 x} = \frac{2 \cdot \frac{\sin x}{\cos x}}{\frac{1}{\cos^2 x}}$

$= 2 \cdot \frac{\sin x}{\cos x} \cdot \frac{\cos^2 x}{1}$

$= 2\sin x\cos x$

$= \sin(2x)$ → RS

34. $\frac{\cos x}{1 + \sin x} + \frac{\cos x}{1 - \sin x} = 2\sec x$

LS → $\frac{\cos x}{(1+\sin x)} \cdot \frac{(1-\sin x)}{(1-\sin x)} + \frac{\cos x}{(1-\sin x)} \cdot \frac{(1+\sin x)}{(1+\sin x)}$

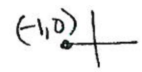
$= \frac{\cos x - \cos x\sin x + \cos x + \cos x\sin x}{(1+\sin x)(1-\sin x)}$

$= \frac{2\cos x}{1-\sin^2 x}$

$= \frac{2\cos x}{\cos^2 x}$

$= \frac{2}{\cos x}$ → $2\sec x$ → RS

35. $\sin(\pi - x) = \sin x$



LS → $\sin\pi\cos x - \cos\pi\sin x$

$= 0 \cdot \cos x - (-1)\sin x$

$= \sin x$ → RS

	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$
S	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
C	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$
T	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$

5.3 36. Find the exact value of $\cos 105°$.

$\cos 105° = \cos(45° + 60°)$

$= \cos 45° \cos 60° - \sin 45° \sin 60°$

$= \frac{\sqrt{2}}{2} \cdot \frac{1}{2} - \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} = \boxed{\frac{\sqrt{2}-\sqrt{6}}{4}}$

5.3-5.4 Rewrite using identities, then simplify if possible.

37. $1 - 2\sin^2 150° = \cos(2 \cdot 150°)$

$= \cos 300°$

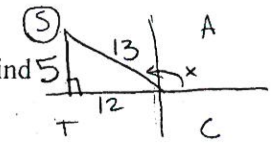
$= \boxed{\frac{1}{2}}$

$\theta ref = 60°$

38. $\sin\left(\frac{\pi}{5}\right)\cos\left(\frac{\pi}{2}\right) + \cos\left(\frac{\pi}{5}\right)\sin\left(\frac{\pi}{2}\right)$

$= \sin\left(\frac{\pi}{5} + \frac{\pi}{2}\right) = \boxed{\sin\left(\frac{7\pi}{10}\right)}$

5.4 39. If $\cos x = -\frac{12}{13}$ and x is in the second quadrant, find



$13^2 = b^2 + 12^2$
$169 - 144 = b^2$
$25 = b^2$

(a) $\sin(2x) = 2\sin x \cos x$

$= 2 \cdot \left(\frac{5}{13}\right)\left(-\frac{12}{13}\right)$

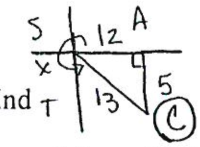
$= \boxed{\frac{-120}{169}}$

(b) $\tan(2x) = \frac{2\tan x}{1 - \tan^2 x}$

$= \frac{2\left(-\frac{5}{12}\right)}{1 - \left(-\frac{5}{12}\right)^2} = \frac{-\frac{10}{12}}{1 - \frac{25}{144}} = \frac{-\frac{10}{12}}{\frac{119}{144}}$

$= \frac{-10}{\cancel{12}} \cdot \frac{\cancel{144}^{12}}{119} = \boxed{\frac{-120}{119}}$

5.4 40. If $\cot x = -\frac{12}{5}$ and x is in the fourth quadrant, find



(a) $\sin(2x) = 2\sin x \cos x$

$= 2\left(-\frac{5}{13}\right)\left(\frac{12}{13}\right)$

$= \boxed{\frac{-120}{169}}$

(b) $\cos(2x)$

$= \cos^2 x - \sin^2 x$

$= \left(\frac{12}{13}\right)^2 - \left(-\frac{5}{13}\right)^2$

$= \frac{144}{169} - \frac{25}{169} = \boxed{\frac{119}{169}}$

Ch5 41. Solve each equation for $[0, 2\pi)$.

(a) $2\sin^2 x = \sqrt{3}\sin x$ $\boxed{x = 0, \pi, \frac{\pi}{3}, \frac{2\pi}{3}}$

$2\sin^2 x - \sqrt{3}\sin x = 0$

$\sin x(2\sin x - \sqrt{3}) = 0$

$\sin x = 0$ $2\sin x - \sqrt{3} = 0$

$x = 0, \pi$ $\sin x = \frac{\sqrt{3}}{2}$

$\theta ref = \frac{\pi}{3}$

$x = \frac{\pi}{3}, \frac{2\pi}{3}$

(b) $8\cos^2 x = 4$

$\cos^2 x = \frac{1}{2}$

$\sqrt{\cos^2 x} = \sqrt{\frac{1}{2}}$

$\cos x = \pm\frac{1}{\sqrt{2}}$

$\boxed{x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}}$

$\theta ref = \frac{\pi}{4}$

(c) $\underbrace{\cos(2x)}$ $+ \sin(x) = 0$

use identity involving only sines!

$1 - 2\sin^2 x + \sin x = 0$ $\boxed{x = \frac{\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6}}$

$0 = 2\sin^2 x - \sin x - 1$

$0 = (2\sin x + 1)(\sin x - 1)$

$2\sin x + 1 = 0$ $\sin x = 1$

$\sin x = -\frac{1}{2}$ $x = \frac{\pi}{2}$

$x = 7\pi, 11\pi$

(d) $\sin(2x) - 2\cos(x) = 0$

$2\sin x \cos x - 2\cos x = 0$

$2\cos x(\sin x - 1) = 0$

$2\cos x = 0$ $\sin x - 1 = 0$

$\cos x = 0$ $\sin x = 1$

$x = \frac{\pi}{2}, \frac{3\pi}{2}$ $x = \frac{\pi}{2}$

$\boxed{x = \frac{\pi}{2}, \frac{3\pi}{2}}$

Ch5 42. Solve for **all** values of x.

(a) $\cos^2 x - 2\sin^2 x + 2 = 0$

* Can also subst for $\cos^2 x$ & solve.

$\cos^2 x - 2(1 - \cos^2 x) + 2 = 0$

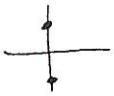
$\cos^2 x - 2 + 2\cos^2 x + 2 = 0$

$3\cos^2 x = 0$

$\cos^2 x = 0$

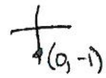
$\sqrt{\cos^2 x} = \sqrt{0}$

$\cos x = 0$ ← No need for $\pm$ because $\pm 0 = 0$



$\boxed{x = \frac{\pi}{2} + 2\pi n \quad x = \frac{3\pi}{2} + 2\pi n}$

(b) $\sin\left(\frac{3\pi}{2} - x\right) = 1$



$\sin\left(\frac{3\pi}{2}\right)\cos(x) - \cos\left(\frac{3\pi}{2}\right)\sin(x) = 1$

$-1 \cdot \cos(x) - 0 \cdot \sin(x) = 1$

$-\cos x = 1$

$\cos x = -1$

$\boxed{x = \pi + 2\pi n}$

Calculator Allowed

4.1 43. The wheel (including the tire) of a sports car under development by an auto company has an eleven inch radius. How many rpm's does the wheel make at 55 mph?

$\frac{55 \text{ miles}}{1 \text{ hr}} \cdot \frac{5280 \text{ ft}}{1 \text{ mile}} \cdot \frac{12 \text{ in}}{1 \text{ ft}} \cdot \frac{1 \text{ rev}}{2\pi \cdot 11 \text{ in}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} = \frac{3484800}{(1320\pi)} = \boxed{840.338 \text{ rpm}}$

4.1 44. Find the measure of the intercepted arc in terms of π in a circle with diameter 60 inches and central angle of 72°.

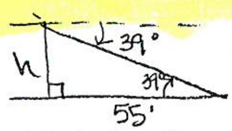
$\frac{72°}{1} \cdot \frac{\pi}{180°} = \frac{2\pi}{5}$

$S = \theta r$

$S = \frac{2\pi}{5}(30 \text{ in})$

$S = \boxed{12\pi \text{ in}}$

4.6 45. The angle of depression from the top of a building to a point 55 feet away from the building (on level ground) is 39°. Determine the height of the building.

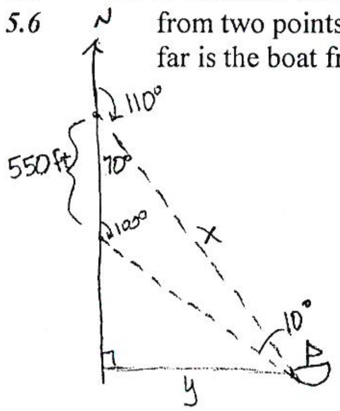


$\tan 39° = \frac{x}{55}$

$x = 55 \tan 39°$

$\boxed{x = 44.538 \text{ ft}}$

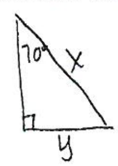
4.6
5.6 46. A shoreline runs north-south, and a boat is due east of the shoreline. The bearings of the boat from two points on the shore are 110° and 100°. Assume the two points are 550 feet apart. How far is the boat from the shore?



ASA → Law of Sines

$\frac{\sin 10°}{550} = \frac{\sin 100°}{x}$

$x = \frac{550 \sin 100°}{\sin 10°}$



$\sin 70° = \frac{y}{x}$

$x \cdot \sin 70° = y$

$\frac{550 \sin 100°}{\sin 10°} \cdot \sin 70° = y$

$\boxed{2931.094 = y}$

5.6 47. Find the area of each triangle.

(a) $a = 7$, $b = 12$, $c = 13$

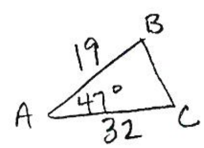
Semiperimeter: $\frac{1}{2}(7 + 12 + 13) = 16$

$A = \sqrt{16(16-7)(16-12)(16-13)}$

$A = \sqrt{1728}$

$\boxed{A = 41.569 \text{ units}^2}$

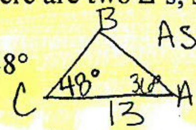
(b) $A = 47°$, $b = 32$, $c = 19$



$A = \frac{1}{2}(19 \cdot 32) \sin 47°$

$\boxed{A = 222.332 \text{ units}^2}$

5.5
5.6 48. Solve each triangle. If there are two Δ's, solve both!



ASA - Law of Sines

(a) $A = 36°$, $b = 13$, $C = 48°$

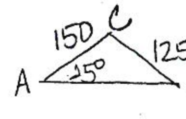
$\boxed{B = 96°}$

$\frac{\sin 96°}{13} = \frac{\sin 36°}{a}$ $\qquad$ $\frac{\sin 96°}{13} = \frac{\sin 48°}{c}$

$a = \frac{13\sin 36°}{\sin 96°}$ $\qquad$ $c = \frac{13\sin 48°}{\sin 96°}$

$\boxed{a = 7.683}$ $\qquad$ $\boxed{c = 9.714}$

(b) $a = 125$, $A = 25°$, $b = 150$



SSA - Law of Sines
* 2Δ's

$\boxed{1st\ \Delta}$

$\frac{\sin 25°}{125} = \frac{\sin B}{150}$

$\sin B = \frac{150\sin 25°}{125}$

$B = \sin^{-1}(\downarrow)$

$\boxed{B_1 = 30.474°}$

$\boxed{C_1 = 124.526°}$

$\frac{\sin 25°}{125} = \frac{\sin C}{c}$

$c = \frac{125\sin C}{\sin 25°}$

$\boxed{c_1 = 243.679}$

$\boxed{2nd\ \Delta}$ * Find suppl. of ∠ we 1st found in 1st Δ...

$B_2 = 180 - B_1$

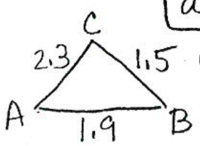
$\boxed{B_2 = 149.526°}$

$\boxed{C_2 = 5.474°}$

$\frac{\sin 25°}{125} = \frac{\sin C_2}{c}$

$c = \frac{125\sin C_2}{\sin 25}$

$\boxed{c = 28.213}$



(c) $a = 1.5$, $b = 2.3$, $c = 1.9$ SSS - Law of Cosines

$1.5^2 = 2.3^2 + 1.9^2 - 2(2.3)(1.9)\cos A$

$\frac{1.5^2 - 2.3^2 - 1.9^2}{-2(2.3)(1.9)} = \cos A \rightarrow A = \cos^{-1}(.760869...)$

$\boxed{A = 40.459°}$

$2.3^2 = 1.9^2 + 1.5^2 - 2(1.9)(1.5)\cos B$

$\frac{2.3^2 - 1.9^2 - 1.5^2}{-2(1.9)(1.5)} = \cos B \rightarrow B = \cos^{-1}(0.1)$

$\boxed{B = 84.261°}$ $\boxed{C = 55.280°}$

9.4 49. The sequence {2, 6, 18, 54, ...} is geometric. Find

$r = 3$

(a) a recursive rule for the nth term. $a_1 = 2$

$a_n = a_{n-1} \cdot 3$ for $n \geq 2$

(b) an explicit formula for the nth term.

$a_n = 2 \cdot 3^{n-1}$

9.4 50. Suppose an arithmetic sequence contains $a_{18} = 49$ and $a_{52} = 174.8$. Find ...

(a) the common difference

(b) a_1

(c) a recursive formula

a) $a_{18} + 34d = a_{52}$

$49 + 34d = 174.8$

$34d = 125.8$

$\boxed{d = 3.7}$

b) $a_n = a_1 + 3.7(n-1)$

$49 = a_1 + 3.7(18-1)$

$49 = a_1 + 62.9$

$\boxed{-13.9 = a_1}$

$a_1 = -13.9$

$a_n = a_{n-1} + 3.7$ for $n \geq 2$

9.4 51. The fourth and ninth terms of a geometric sequence are 128 and 131072 respectively. Find

a) the common ratio

b) a_1

c) an explicit formula

a) $a_4 \cdot r^5 = a_9$

$128r^5 = 131072$

$r^5 = 1024$

$r = \sqrt[5]{1024}$

$\boxed{r = 4}$

b) $a_n = a_1 \cdot 4^{n-1}$

$128 = a_1 \cdot 4^{4-1}$

$128 = a_1(64)$

$\boxed{2 = a_1}$

$a_n = 2(4)^{n-1}$