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Lecture 28 Answers

1. 47 , 33 , 37
2. 1.2566370614359 , 0.3 , 1.2566370614359
3. 52°
4. 1.0471975511966
5. $\frac{1}{2}$, $\frac{\sqrt{3}}{2}$, $\frac{1}{\sqrt{3}}$, 2 , $\frac{2}{\sqrt{3}}$, $\sqrt{3}$
6. $\sqrt{3}$, 2 , $\frac{1}{\sqrt{2}}$
7. 0.45812284729085 , 2.182820625327 , 1.125 , 1.9402850002907 , 0.51538820320221
8. $\frac{\sqrt{165}}{13}$, $\frac{2}{\sqrt{165}}$, $\frac{13}{2}$, $\frac{13}{\sqrt{165}}$, $\frac{\sqrt{165}}{2}$
9. 4 , $4 \cdot \sqrt{2} = 5.6568542494924$
10. $\frac{4\sqrt{41}}{41}$, $\frac{5\sqrt{41}}{41}$, $\frac{4}{5}$, $\frac{\sqrt{41}}{5}$, $\frac{\sqrt{41}}{4}$, $\frac{5}{4}$
11. 10.392304845413 , 12 , 60
12. 2.5881904510252 , 9.6592582628907 , 75
13. $\frac{120}{169} = 0.71005917159763$, $\frac{119}{169} = 0.70414201183432$, $\frac{120}{119} = 1.0084033613445$, $\frac{169}{119} = 1.4201680672269$, $\frac{169}{120} = 1.4083333333333$, $\frac{119}{120} = 0.99166666666667$
14. $\frac{7\sqrt{149}}{149}$, $\frac{10\sqrt{149}}{149}$, $\frac{7}{10}$, $\frac{\sqrt{149}}{10}$, $\frac{\sqrt{149}}{7}$, $\frac{10}{7}$
15. $\frac{88}{137} = 0.64233576642336$, $\frac{105}{137} = 0.76642335766423$, $\frac{88}{105} = 0.83809523809524$, $\frac{137}{105} = 1.3047619047619$, $\frac{137}{88} = 1.5568181818182$, $\frac{105}{88} = 1.1931818181818$
16. $\tan(35^\circ) = \frac{91}{x_1}$ & $\tan(44^\circ) = \frac{91}{x_2}$ & $x = x_1 + x_2 = 224.19472716847$
17. $\tan(26^\circ) = \frac{97}{x_2}$ & $\tan(54^\circ) = \frac{97}{x_1}$ & $x = x_2 - x_1 = 128.40484741667$
18. 31.606026899044
19. 287.75114919799
20. 5181.0201926006
21. 553.42614922892
22. 318.05916548197

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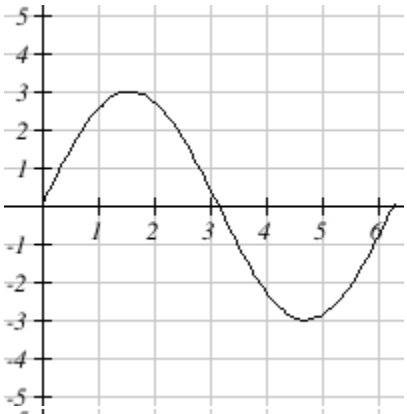
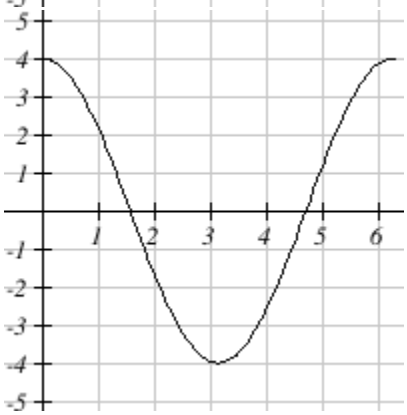
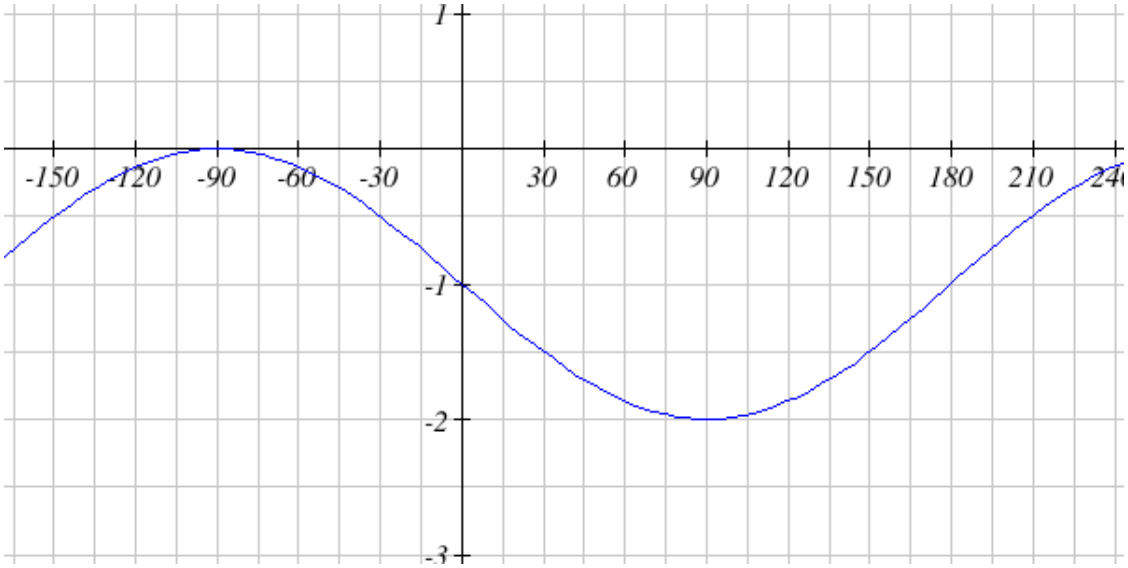
Lecture 29 Answers

1. 

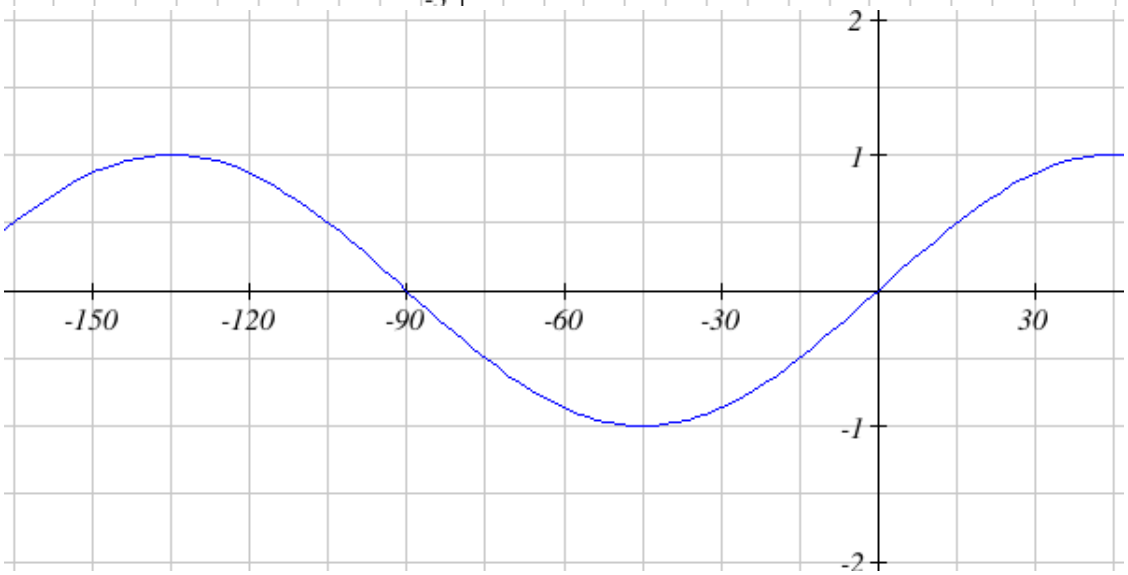
2. 

3. $8 \cdot \sin(x - 5) - 8$
4. 6 , 1.0471975511966
5. 2 , 50.265482457437
6. 2 , 5 , -2
7. 5 , 0.78539816339745 , 3 , Right , 4
8. 5 , 1.0471975511966 , 7 , Right , 3
9. 5 , 12 , 2 , Left , 3
10. $y = 4\sin\left(\frac{\pi}{3}x\right) + 1$
11. $y = 3\cos\left(\frac{\pi}{7}x\right) + 0$
12. $4\sin\left(\frac{\pi}{3}x\right)$

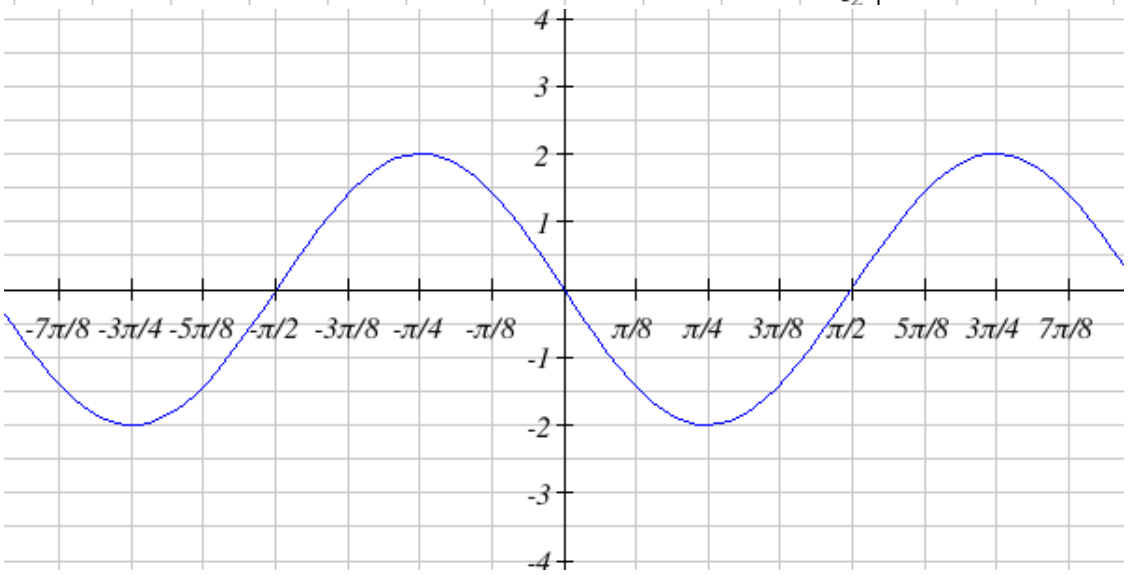
13.


1
-150
-120
-90
-60
-30
30
60
90
120
150
180
210
-1
-2
-3

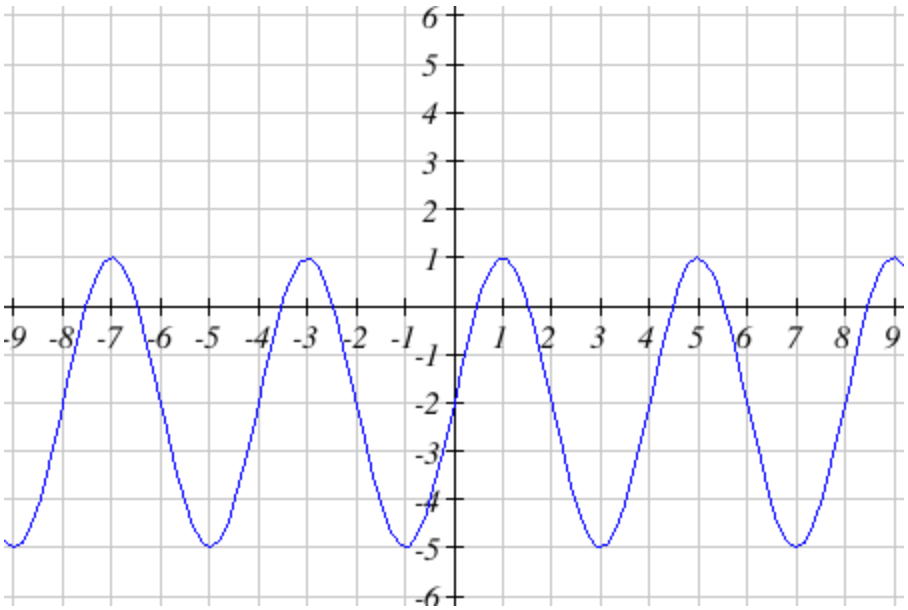
14.


2
1
-150
-120
-90
-60
-30
30
-1
-2

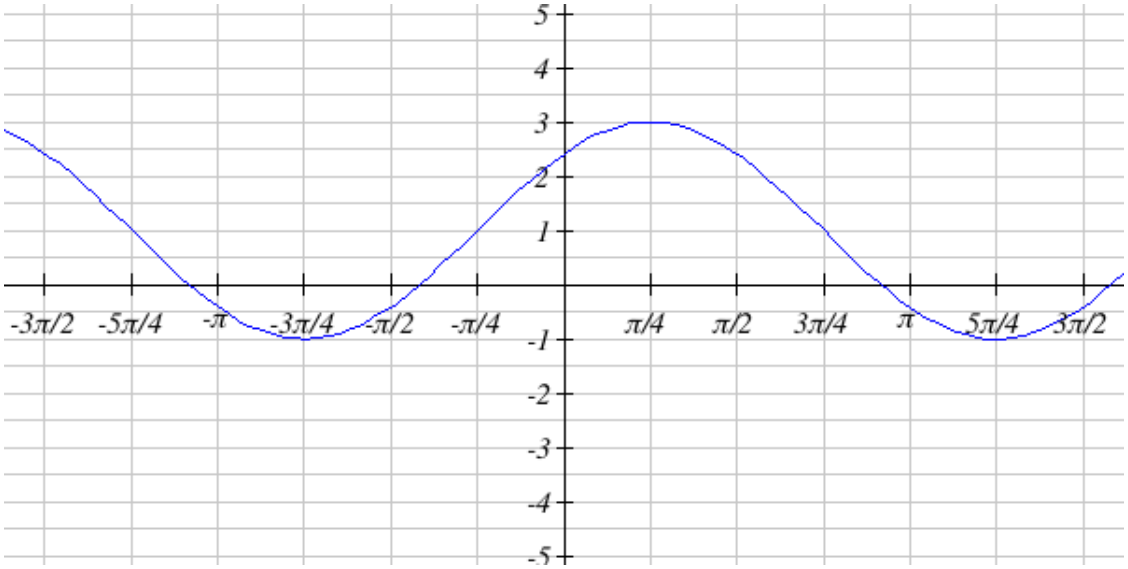
15.


4
3
2
1
-7π/8
-3π/4
-5π/8
-π/2
-3π/8
-π/4
-π/8
π/8
π/4
3π/8
π/2
5π/8
3π/4
7π/8
-1
-2
-3
-4

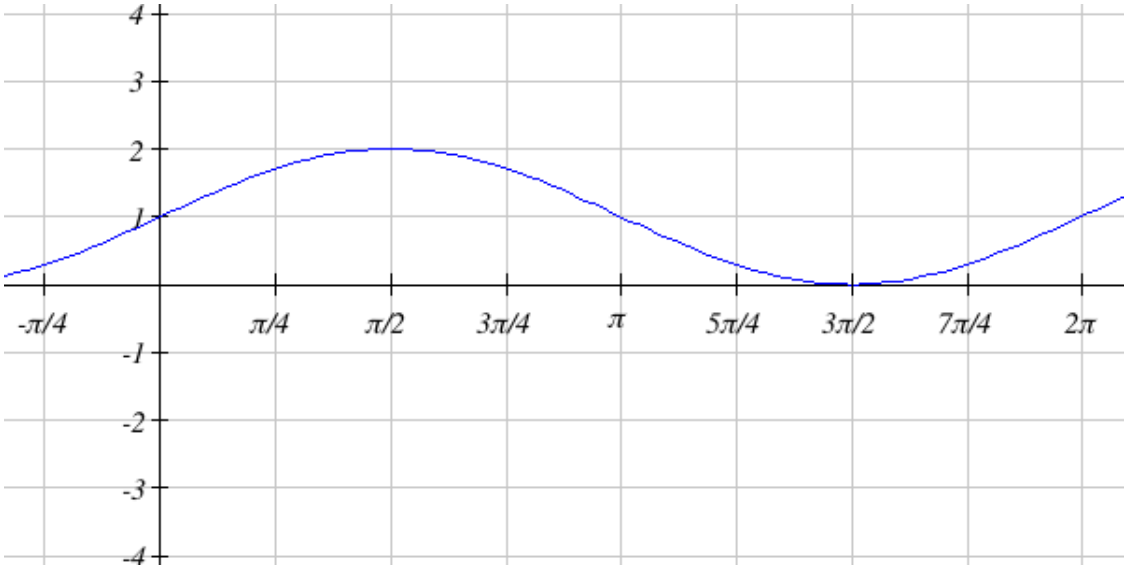
16.


6
5
4
3
2
1
-9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9
-1
-2
-3
-4
-5
-6

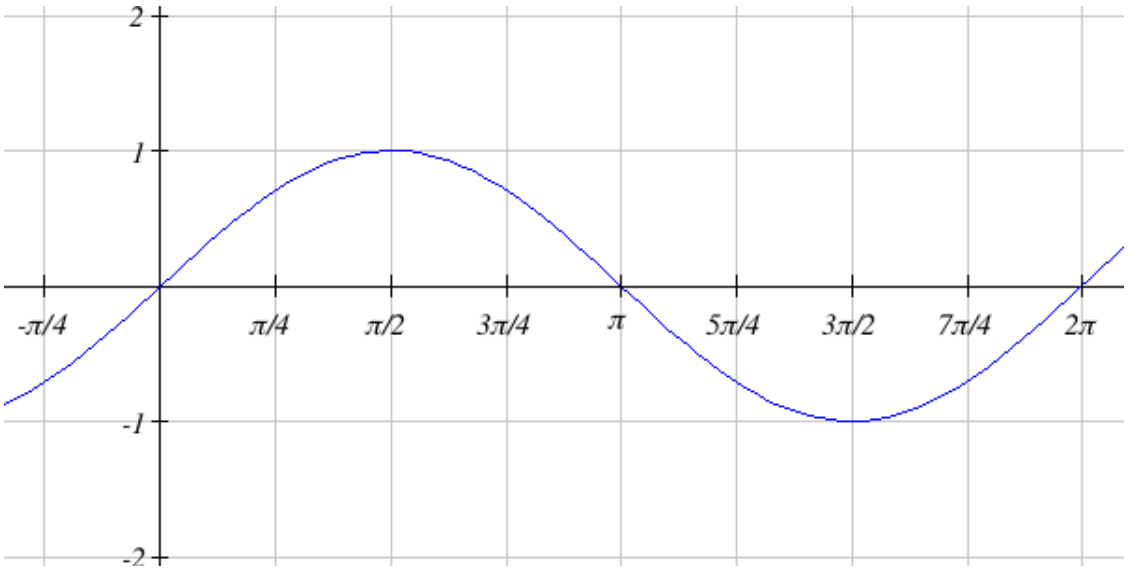
17.


5
4
3
2
1
-3π/2 -5π/4 -π -3π/4 -π/2 -π/4 π/4 π/2 3π/4 π 5π/4 3π/2
-1
-2
-3
-4
-5

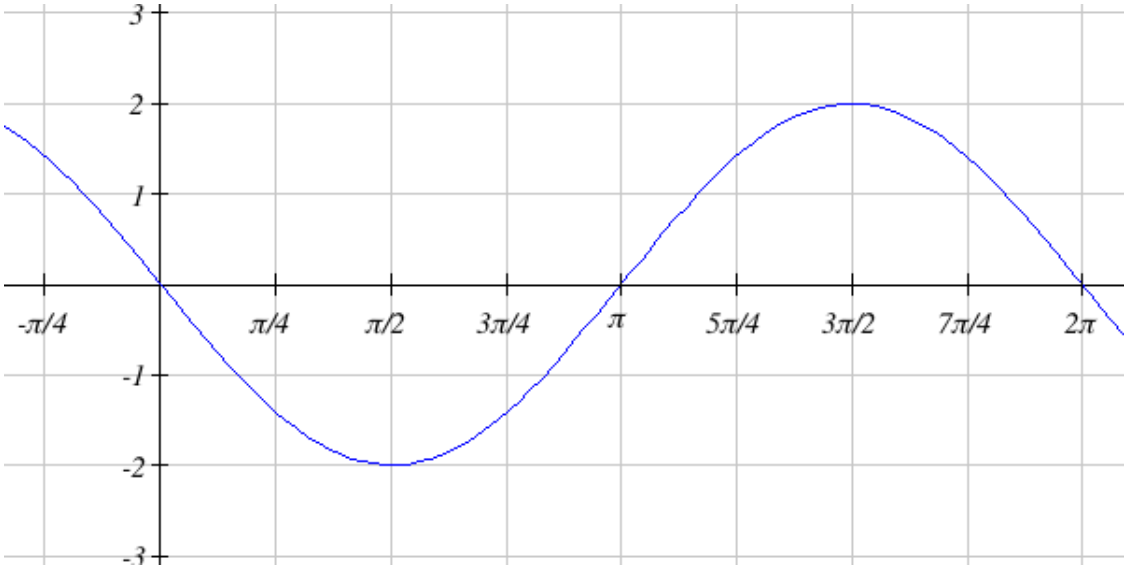
18.


4
3
2
1
-π/4 π/4 π/2 3π/4 π 5π/4 3π/2 7π/4 2π
-1
-2
-3
-4

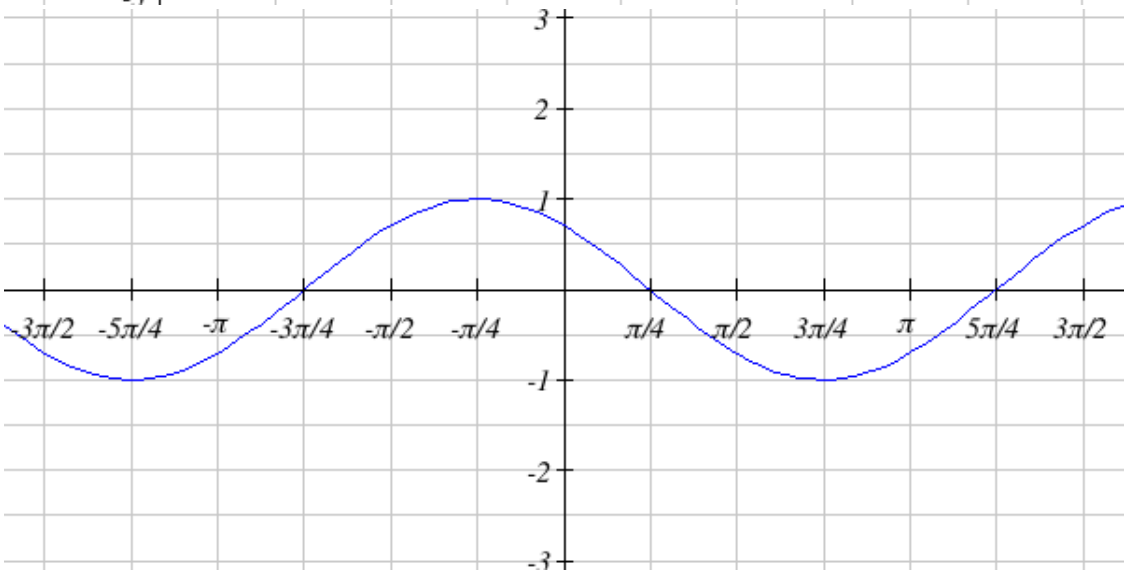
19.

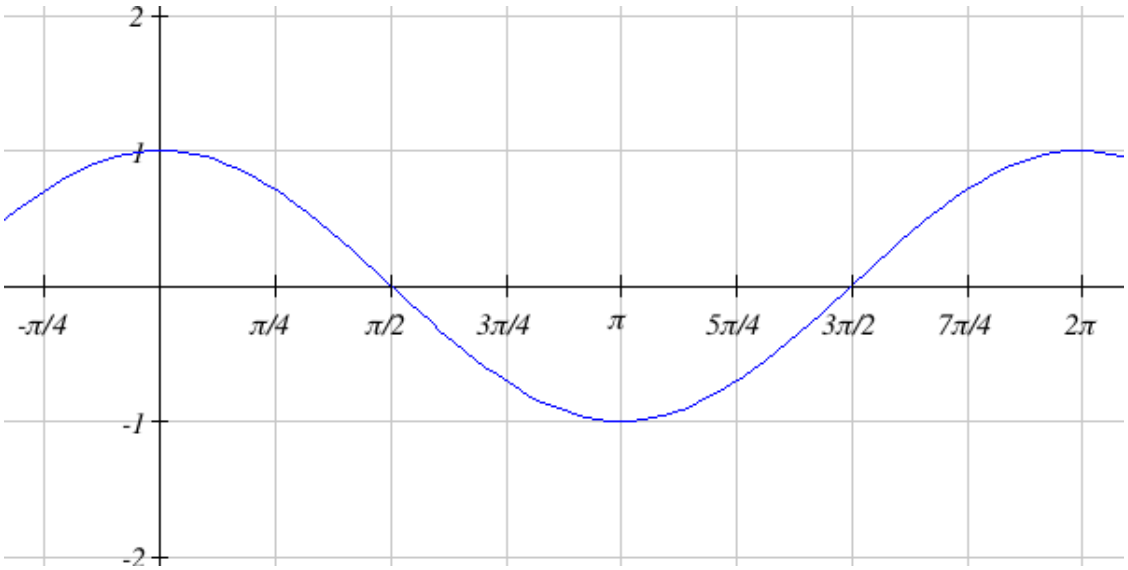

2
1
-1
-2
-π/4
π/4
π/2
3π/4
π
5π/4
3π/2
7π/4
2π

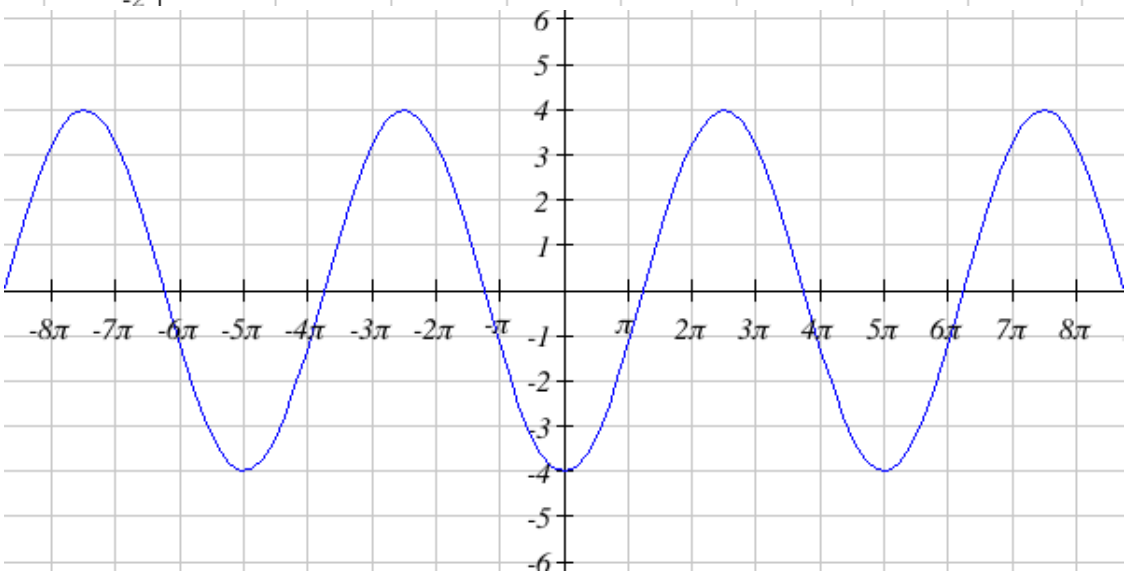
20.


3
2
1
-1
-2
-3
-π/4
π/4
π/2
3π/4
π
5π/4
3π/2
7π/4
2π

21.


3
2
1
-1
-2
-3
-3π/2
-5π/4
-π
-3π/4
-π/2
-π/4
π/4
π/2
3π/4
π
5π/4
3π/2

22. 

23. 

24. $70 - 11 \cdot \sin\left(\frac{\pi}{12} \cdot t\right)$

25. 7.5 , 11.5 , 4 , 19

26. $-15 \cdot \cos\left(\frac{\pi}{2} \cdot t\right) + 19$

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Lecture 30 Answers

1. $\frac{\pi}{2}, \frac{3\pi}{2}$
2. $\frac{\pi}{2}, \frac{3\pi}{2}, \quad 0, \pi$
3. y = csc(x)
4. y = tan(x)
5. e c a b
6. $\frac{5}{7}$
7. $\frac{16\pi}{5}$
8. $\frac{4}{9}$
9. $\frac{\pi}{3}, \quad 2, \quad$ Right
10. $\frac{2\pi}{3}, \quad 8, \quad$ Left
11. $3, \quad 5, \quad$ Left
12. $2\sec\left(\frac{2\pi}{5}x\right) + 1$
13. $2\tan(x) - 2$
14. $2\tan\left(\frac{\pi}{2}x\right)$
15. $f(x) = -4\tan\left(\frac{\pi}{4}x\right) - 1$

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Lecture 31 Answers

1. $-\frac{\pi}{2}$, $-\frac{\pi}{3}$, $\frac{\pi}{2}$
2. $\frac{\pi}{6}$, $\frac{\pi}{3}$, $\frac{5\pi}{6}$
3. $\frac{\pi}{4}$, $-\frac{\pi}{6}$, $\frac{\pi}{6}$
4. 0.95206763612265
5. Quadrant 3
   Quadrant 4 ,
   Quadrant 4
6. Quadrant 2
   Quadrant 3 ,
   Quadrant 2
7. b e d f
8. 0.6
9. DNE
10. $\frac{-3\pi}{7}$
11. $\frac{-5\pi}{12}$
12. $\frac{\pi}{4}$
13. $\frac{\pi}{4}$
14. -50
15. 1.3
16. $\frac{-4\pi}{9}$
17. 1
18. 63.434948822922
19. $\frac{\pi}{3}$
20. $\frac{\pi}{4}$
21. $\frac{\sqrt{8}}{3}$
22. $\frac{3}{\sqrt{9+a^2}}$
23. 20.56 , 8.54 , 8
24. $\frac{1}{\sqrt{y^2+1}}$
25. $\frac{\sqrt{1-x^2}}{x}$

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Lecture 32 Answers

1. 10.24695076596 , 37.979872444852 , 52.020127555148
2. 7.2801098892805 , 74.054604099077 , 15.945395900923
3. 1.819851171331 , 5.3208888623796 , 20
4. 1.2155372436685 , 6.8936542710855 , 80
5. 3.1058285412302
6. 12.557035741758
7. 60 , 44
8. $\sin(62^\circ) = \frac{37}{x_1}$ & $\sin(54^\circ) = \frac{x_1}{x}$ & $x = 51.797542161485$
9. 421.85321760261
10. 359.15772250744
11. 218
12. $1\left(\sqrt{3} - \sqrt{2}\right)$
13. 17,993,000
14. 61.6835
15. 4241
16. 234.68233955419

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Lecture 33 Answers

1. $\tan(t)$
2. $\cot(t)$
3. $\sec(t)$
4. $\csc(t)$
5. $\cot^2(t)$
6. 3 , -0.1 , 0.7 , -3.5
7. $-\csc(x)$
8. -1
9. 1
10. $\sin(x)$
11. 4 , 2
12. $\big(\cos(x)\big)^2$
13. $\csc(t)$
14. $\sec(u)\csc(u)$
15. $(2\sin(x)-1)(\sin(x)-1)$
16. $(2\sin(x)+1)(\sin(x)-1)$
17. $\frac{\sqrt{221}}{10}$
18. $7\sin(t)$, $7\cos(t)$
19. $2\tan(t)$, $2\sec(t)$
20. $5\sec(t)$, $5\tan(t)$

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Lecture 34 Answers

1. $\frac{\pi}{6}, \frac{5\pi}{6}$
2. $\frac{\pi}{4}, \frac{3\pi}{4}$
3. $\frac{5\pi}{4}, \frac{7\pi}{4}$
4. $\frac{\pi}{6}, \frac{11\pi}{6}$
5. 0.43344532006989 , 2.7081473335199
6. 1.2556032943542 , 5.0275820128254
7. $\frac{\pi}{3}, \frac{5\pi}{3}$
8. $\frac{\pi}{2} + k\pi$
9. $\frac{\pi}{2} + 2k\pi$ or $\frac{3\pi}{2} + k\pi$, any integer
10. $\frac{\pi}{4}, -\frac{3\pi}{4}$
11. $\frac{\pi}{4}, \frac{5\pi}{4}$
12. $\frac{7\pi}{6}, \frac{11\pi}{6}, \frac{3\pi}{2}$
13. $\frac{2\pi}{3}, \frac{4\pi}{3}, \pi$, k any integer
14. $0 + 2k\pi$
15. $\pi + 2k\pi$ or $-\pi + 2k\pi$, any integer
16. $2k\pi$, any integer
17. $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}$
18. $\arctan(2), \pi + \arctan(2)$
19. REMOVED
20. $\frac{4\pi}{9}, \frac{5\pi}{9}, \frac{10\pi}{9}, \frac{11\pi}{9}, \frac{16\pi}{9}, \frac{17\pi}{9}$
21. $0,60,120,180,240,300$
22. $105,165,285,345$

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Lecture 35 Answers

1. $1\,,\quad 1$
2. $8\,,\quad 3$
3. $\sin(x)+1$
4. $\cos(t)$
5. $\csc^2(t)$
6. $\cos(y)$
7. $\frac{-\cos(x)(1+\sin(x))+\cos(x)(1-\sin(x))}{(1-\sin(x))(1+\sin(x))}\,,\quad -\frac{2\cdot\cos(x)\cdot\sin(x)}{1-(\sin(x))^2}\,,\quad -\frac{2\cdot\cos(x)\cdot\sin(x)}{(\cos(x))^2}\,,\quad -\frac{2\cdot\sin(x)}{\cos(x)}$
8. $\left(\frac{1}{\sin(y)}+\frac{\cos(y)}{\sin(y)}\right)^2\,,\quad \left(\frac{1+\cos(y)}{\sin(y)}\right)^2\,,\quad \frac{(1+\cos(y))^2}{1-(\cos(y))^2}\,,\quad \frac{(1+\cos(y))^2}{(1-\cos(y))(1+\cos(y))}$