

Solutions of Questions from old exams

**1 Section 6.1**

- 1.
2. d

**2 Section 6.2**

1. (a)  $\frac{-\sqrt{3}}{3}$   
(b)  $\frac{\sqrt{3}}{2}$   
(c)  $2 + \sqrt{3}$   
(d)  $\frac{\sqrt{2}-\sqrt{6}}{4}$   
(e)  $\frac{\sqrt{6}-\sqrt{2}}{4}$   
(f)  $\frac{\sqrt{2}+\sqrt{6}}{4}$   
(g)  $-\frac{\sqrt{2}+\sqrt{6}}{4}$   
(h)  $\frac{\sqrt{2}-\sqrt{6}}{4}$   
(i)  $\frac{1}{2}$   
(j)  $-3$   
(k)  $\frac{\sqrt{3}}{2}$   
(l)  $\frac{\sqrt{2}-\sqrt{6}}{4}$   
(m)  $\sqrt{3}$   
(n)  $0$   
(o)  $1$
2. c
3. (a)  $\cot y$   
(b)  $\tan 2\alpha$   
(c)  $\cos \alpha$
4.  $0, -1$
5.  $\frac{-25}{24}$
6. d
7.  $\frac{-1}{2}$

8.  $-\frac{4}{3}$
9. a
10. a
11. b
12.  $\frac{33}{56}$
13.  $\frac{56}{65}$
14.  $\frac{4\sqrt{3}+3}{10}$
15.  $2(-1)^n$
16.  $\frac{2\sqrt{6}-1}{6}$
17. e
18.  $\frac{\sqrt{5}}{5}$
19.  $\frac{3}{10}$
20.  $\frac{33}{65}$
21. d
22.  $-4^\circ$
23. b
24.  $\frac{19}{17}$
25.  $79^\circ$
26. a
27.  $(-\frac{4}{5}, -\frac{3}{5})$
28.  $-\frac{12}{13}$
29.  $\frac{3-\sqrt{33}}{12}$
30.  $-\frac{2}{3}$

### 3 Section 6.3

1.  $\frac{7}{8}$
2. 3
3.  $k = \frac{1}{2}, t = \pm 4$
4.  $\frac{\pi}{2}$
- 5.
6. c
7. a
8. d
9. c
10. (a)  $\tan^2 \theta$   
(b)  $\sec \theta$   
(c) 1  
(d)  $\sec^2 x$
11.  $-\frac{\sqrt{6}}{3}$
12.  $(\frac{-7}{25}, \frac{24}{25})$
13.  $-\frac{7}{9}$
14. b
15.  $-\frac{\sqrt{15}}{8}$
16. 2
17. a
18.  $k = 6, |t| = 2.$
19.  $\frac{1}{4}$
20.  $k = -\frac{5}{2}, t = 10$
21. b
22. d
23. 2
24.  $k = -\frac{1}{2}, t = 2.$

25.  $-\frac{4}{5}$

26.  $-\frac{4}{5}$

27.  $\frac{3}{2}$

28.  $\frac{\sqrt{10}}{10}$

29. c

30. d

31. (a)  $1 - \sqrt{2}$

(b)  $\frac{1}{4}$

32.  $\frac{65}{33}, -\frac{2\sqrt{5}}{5}$

33.  $-\frac{1}{2}$

34.  $2 - \sqrt{3}$

35. e

36. c

37.  $-\frac{\sqrt{10}}{10}$

38. d

39.  $-\sqrt{2}$

40.  $1 - \sqrt{2}$

41.  $\frac{7}{24}$

42.  $\frac{\sqrt{2+\sqrt{2}}}{2}$

43.  $\frac{\sqrt{5}}{5}$

44.  $-\frac{\sqrt{6}}{6}$

45. 1 d    2 a    3 g    4 c or b    5 f

## 4 Section 6.4

1. c
2.  $-13$
3.  $\frac{3\pi}{8}$  to the left
4.  $k = 4, t = 300^\circ$
5. e
6.  $[-\sqrt{2}, \sqrt{2}]$
7. d
8.  $a = 2, \alpha = \frac{5\pi}{6}$
9.  $5, 4\pi$
10. Range =  $[2 - \sqrt{2}, 2 + \sqrt{2}]$ , Phase Shift =  $\frac{\pi}{4}$  to the right.
11.  $A = 2, \alpha = \frac{4\pi}{3}$
12.  $f(x) = \sin 2\left(x - \frac{\pi}{12}\right)$ 
  - (a)  $[-1, 1]$
  - (b)  $\pi$
  - (c) 1
  - (d)  $\frac{\pi}{12}$  to the right
13.  $f(x) = 2\sin\left(x - \frac{\pi}{3}\right)$ , Amplitude = 2, Period =  $2\pi$ , Phase Shift =  $\frac{\pi}{3}$  to the right.
14. 7
15. 5
16.
  - (a) 2
  - (b)  $2\pi$
  - (c)  $\frac{\pi}{6}$  to the right
  - (d)  $[-2, 2]$

## 5 Section 6.5

1.  $\frac{1}{x} + \sqrt{1-x^2}$
2. Domain  $[-\frac{1}{2}, \frac{1}{2}]$  and Range  $[0, \pi]$
3.  $\frac{4\sqrt{17}}{17}$
4. Domain  $[-\frac{2}{3}, 0]$  and Range  $[-\frac{3\pi}{2}, \frac{-\pi}{2}]$
5. 0
6. 0
7. b
8. Domain  $[-\frac{1}{2}, \frac{1}{2}]$  and Range  $[-1, 1]$
9.  $\frac{-\pi}{4}$
10. e
11.  $|x|$
12. 7
13.  $\frac{\pi}{2}$
14.  $\frac{5\pi}{12}$
15. Domain  $[0, 1]$  and Range  $[-\frac{3\pi}{2}, \frac{3\pi}{2}]$
16.  $\frac{-4}{5}$
17. c
18. 1
19.  $\frac{-\pi}{5}$
20.  $\frac{3\sqrt{10}-\sqrt{30}}{20}$
21.  $\frac{-\pi}{5}$
22.  $\frac{5}{13}$
23.  $\frac{-24}{25}$
24. c
25.  $\frac{-\pi}{3}$
26. b

## 6 Section 6.6

1. (a)  $\left\{\frac{\pi}{3}, \pi, \frac{5\pi}{3}\right\}$   
(b)  $\left\{\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}\right\}$   
(c)  $\left\{\frac{\pi}{6}, \frac{5\pi}{6}\right\}$   
(d)  $\left\{\frac{3\pi}{2}, \frac{5\pi}{2}, \frac{7\pi}{2}\right\}$   
(e)  $\left\{0, \frac{\pi}{3}\right\}$   
(f)  $\left\{0, \frac{\pi}{6}, \frac{\pi}{2}, \frac{5\pi}{6}, \pi, \frac{7\pi}{6}, \frac{3\pi}{2}, \frac{11\pi}{6}\right\}$   
(g)  $\phi$   
(h)  $\left\{\frac{7\pi}{6}, \frac{\pi}{2}, \frac{11\pi}{6}\right\}$   
(i)  $\{0, \pi\}$   
(j)  $\left\{\frac{\pi}{2}, \frac{5\pi}{2}, \frac{9\pi}{2}\right\}$   
(k)  $\left\{\frac{\pi}{8}, \frac{3\pi}{8}, \frac{9\pi}{8}, \frac{11\pi}{8}\right\}$   
(l)  $\left\{\frac{\pi}{9}, \frac{5\pi}{9}, \frac{7\pi}{9}\right\}$   
(m)  $\left\{\frac{\pi}{4}, \frac{3\pi}{4}\right\}$   
(n)  $\{60^\circ, 90^\circ, 120^\circ, 270^\circ\}$   
(o)  $\left\{\frac{\pi}{12}, \frac{11\pi}{12}\right\}$   
(p)  $\left\{\frac{\pi}{3}, \pi, \frac{5\pi}{3}\right\}$   
(q)  $\left\{\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{3\pi}{2}\right\}$   
(r)  $\left\{\frac{\pi}{3}, \frac{5\pi}{3}\right\}$   
(s)  $\{60^\circ, 180^\circ\}$   
(t)  $\left\{\frac{3\pi}{2}, \frac{9\pi}{2}, \frac{11\pi}{2}\right\}$   
(u)  $\{30^\circ, 45^\circ, 135^\circ, 150^\circ, 225^\circ, 315^\circ\}$   
(v)  $\left\{\frac{5\pi}{6}, \frac{7\pi}{6}\right\}$
2.  $\left(\frac{\pi}{3}, 1\right)$  and  $\left(\frac{5\pi}{3}, 1\right)$