Questions from old Exams

1 Section 6.1

1. Verify the identity

   (a) $\sqrt{\frac{1+\sin x}{1-\sin x}} = \frac{1+\sin x}{\cos x}$, $\cos x > 0$.

   (b) $\frac{1}{1-\cos x} - \frac{\cos x}{1+\cos x} = 2\csc^2 x - 1$.

   (c) $\frac{1}{1-\sin\theta} + \frac{1}{1+\sin\theta} = 2\sec^2\theta$.

   (d) $\frac{\cos x \tan x + 2\cos x - \tan x - 2}{\tan x + 2} = \cos x - 1$.

   (e) $\sqrt{\frac{1-\cos x}{1+\cos x}} = \csc x - \cot x$, $0 < x < \frac{\pi}{2}$.

2. Which one of the following is an identity?

   (a) $\sqrt{\sin^2 x} = \sin x$

   (b) $\sqrt{1-\cos^2 x} = \sin x$

   (c) $1 - \cot^2 x = \csc^2 x$

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

   (e) $\sec x = \sqrt{1+\tan^2 x}$

2 Section 6.2

1. Find the exact value of

   (a) $\frac{\tan\frac{7\pi}{12} - \tan\frac{3\pi}{4}}{1+\tan\frac{7\pi}{12}\tan\frac{3\pi}{4}}$

   (b) $\frac{(1-\tan 12^\circ \tan 33^\circ)}{\tan 12^\circ + \tan 33^\circ}(\cos 13^\circ \cos 17^\circ - \cos 77^\circ \cos 73^\circ)$

   (c) $\tan 15^\circ$

   (d) $\cos\left(-\frac{7\pi}{12}\right)$

   (e) $\cos\left(\frac{19\pi}{12}\right)$

   (f) $\sin 75^\circ$

   (g) $\sin 255^\circ$

   (h) $\cos 255^\circ$

   (i) $\sin 27^\circ \cos 57^\circ - \sin 63^\circ \cos 33^\circ$

   (j) $\cos 20^\circ - \sin 70^\circ + \csc\frac{19\pi}{6} + \tan\left(-\frac{9\pi}{4}\right)$

   (k) $\cos 12^\circ \cos 42^\circ + \cos 78^\circ \cos 48^\circ$

   (l) $\sin 195^\circ$

   (m) $\frac{\tan 75^\circ - \cot 75^\circ}{1+\cot 15^\circ \cot 75^\circ}$

(n) $\frac{\tan\frac{7\pi}{9}+\tan\frac{2\pi}{9}}{1-\tan\frac{7\pi}{9}\tan\frac{2\pi}{9}}$

(o) $\sin\frac{\pi}{10}\cos\frac{2\pi}{5}-\cos\frac{\pi}{10}\sin\left(-\frac{2\pi}{5}\right)$

2. $\sin\frac{29\pi}{7}\cos\frac{2\pi}{7}+\cos\frac{\pi}{7}\sin\frac{16\pi}{7}=$

(a) $-\sin\frac{\pi}{7}$

(b) $\sin\frac{9\pi}{7}$

(c) $\sin\frac{3\pi}{7}$

(d) $-\cos\frac{\pi}{7}$

(e) $-\sin\frac{3\pi}{7}$

3. Simplify the following in terms of a single trigonometric function

(a) $\frac{\cos(x-y)}{\cos x\sin y}-\frac{\tan(x+y)-\tan y}{1+\tan(x+y)\tan y}$

(b) $\frac{\tan(\alpha+\beta)+\tan(\alpha-\beta)}{1-\tan(\alpha-\beta)\tan(\alpha+\beta)}$

(c) $\sin\beta\left[\frac{\cos(\alpha+\beta)}{\sin\beta\cos\beta}+\frac{\sin\alpha}{\cos\beta}\right]$

4. If $\alpha+\beta=\pi$, then find $\cos\alpha+\cos\beta$. Also use that to find the value of $\cos\left(\frac{\pi}{5}\right)+\cos\left(\frac{2\pi}{5}\right)+\cos\left(\frac{3\pi}{5}\right)+\cos\left(\frac{4\pi}{5}\right)+\cos\left(\frac{5\pi}{5}\right)$

5. Given $\tan\alpha=-\frac{3}{4}$ for α in quadrant II and $\csc\beta=-\frac{5}{4}$ for β in quadrant IV, find $\sec(\alpha-\beta)$.

6. Which one of the following statements is FALSE?

(a) $\tan\left(\frac{\pi}{2}+\theta\right)=-\cot\theta$

(b) $\sec\left(\frac{\pi}{2}+\theta\right)=-\csc\theta$

(c) $\cot\left(\frac{\pi}{2}+\theta\right)=-\tan\theta$

(d) $\csc\left(\frac{\pi}{2}+\theta\right)=-\sec\theta$

7. If $\cos\alpha=\cos\beta=\frac{1}{2}$, then find the value of $\cos(\alpha+\beta)\cos(\alpha-\beta)$.

8. If the point $\left(-1,\frac{3}{4}\right)$ lies on the terminal side of angle θ in standard position, then find the exact value of $\tan\left(\frac{\pi}{2}-\theta\right)$.

9. Which one of the following is TRUE for all values of x for which the expressions are defined?

(a) $\left(\cot^2 x\right)\left(\sin^2 x-\tan^2 x\right)=-\sin^2 x$

(b) $\cot^2 x\left(1+\tan^2 x\right)=\sin^2 x$

(c) $\sin x=\sqrt{1-\cos^2 x}$

(d) $\cot^2 x-\csc^2 x=1$

(e) $2\sin x=\sin 2x$

10. Which one of the following is TRUE for all values of x and y for which the expressions are defined?

    (a) $\sec(\pi - x) = -\sec x$
    (b) $\cos(x + y) + \cos(x - y) = -2\cos x \cos y$
    (c) $\cos\left(\frac{\pi}{2} + x - y\right) = \sin(x - y)$
    (d) $\csc\left(\frac{\pi}{2} - x\right) = -\sec x$
    (e) $\cos(\pi + x - y) = \sin x \sin y - \cos x \cos y$

11. Which one of the following is TRUE for all real values of x for which the expressions are defined?

    (a) $\sqrt{\cos^2 x} = \cos x$
    (b) $\cos(-x + \pi) = -\cos x$
    (c) $\sin(-x + 2\pi) = \sin x$
    (d) $\csc x = \sqrt{1 + \cot^2 x}$
    (e) $\tan^2 x + \sec^2 x + 1 = 0$

12. If $\sin S = -\frac{4}{5}$, and $\cos t = -\frac{12}{13}$ such that S and t are in quadrant III, then find $\tan(S - t)$.

13. If $\cos S = -\frac{3}{5}$, and $\sin t = \frac{5}{13}$ such that S and t are in quadrant II, then find $\cos(S - t)$.

14. If $\cos\theta = 0.8$ and θ is in quadrant IV, then find $\cos(\theta + \frac{\pi}{6})$.

15. For all positive integers n, find the value of $\cos(n + 2)\pi - \sin(2n + 3)\frac{\pi}{2}$.

16. If the terminal side of angle θ passes through $(-1, \sqrt{8})$, then find the value of $\sin(\frac{5\pi}{6} - \theta)$.

17. $\cos(\frac{\pi}{2} - x)=$

    (a) $\cos(\frac{\pi}{2} + x)$.
    (b) $\sin(\frac{\pi}{2} + x)$.
    (c) $\cos(\pi - x)$.
    (d) $\sin(\frac{\pi}{2} - x)$.
    (e) $\sin x$.

18. If the terminal side of an angle θ lies on the line $y = 3x$, $x < 0$, then find the value of $\cos(\theta + \frac{\pi}{4})$.

19. If $\tan(x + y) = 33$, and $\tan x = 3$, then find the value of $\tan y$.

20. If $\sin x = \frac{3}{5}$, and $\cos y = -\frac{5}{13}$ where x is in quadrant II and y is quadrant III, then find the value of $\sin(x + y)$.

21. Which one of the following is NOT an identity?

    (a) $\csc(-\theta) = -\csc\theta$.
    (b) $\sec(90^\circ - \theta) = \csc\theta$.
    (c) $\cot(90^\circ - \theta) = \tan\theta$.

(d) $\tan(-\theta) = \tan\theta$.

(e) $\csc(\theta - 90^\circ) = -\sec\theta$.

22. If $\cot(51^\circ - 3x) = \tan(25^\circ - \frac{x}{2})$, then find the value of x.

23. If A and B are the acute angles such that $\tan A = \frac{1}{4}$ and $\tan B = \frac{3}{5}$, then

(a) $A + B = 135^\circ$.

(b) $A + B = 45^\circ$.

(c) $90^\circ < A + B < 120^\circ$.

(d) $\cot(A + B) > \tan(A + B)$.

(e) $\sin(A + B) = \frac{3}{20}$.

24. If $\tan x = \frac{3}{4}$ and $\tan y = \frac{1}{5}$, then find the value of $\tan(x + y)$.

25. If $0^\circ < \theta < 90^\circ$ and $\cos\theta = \sin 11^\circ$, then find the value of θ.

26. Let n be any positive integer, which one of the following is FALSE?

(a) $\sin[(4n - 3)\frac{\pi}{2}] = (-1)^{n-1}$.

(b) $\tan[(\frac{4n+1}{4})\pi] = 1$.

(c) $\sec(n\pi) = (-1)^n$.

(d) $\cos[(3n - 2)\pi] = (-1)^n$.

(e) $\sin[(2n - 1)\frac{\pi}{2}] = (-1)^{n-1}$.

27. If $P(-\frac{3}{5}, \frac{4}{5})$, is the point on the unit circle corresponding to an arc length S, then find the point on the unit circle corresponding to arc length $S + 441\frac{\pi}{2}$.

28. If $P(x, \frac{5}{13})$, $x > 0$ is the point on the unit circle corresponding to an arc length S, then find $\cos(3\pi - S)$.

29. If $P(\frac{\sqrt{3}}{6}, \frac{\sqrt{33}}{6})$ is the point on the unit circle corresponding to arc length S and $Q(b, c)$ is the point on the unit circle corresponding to arc length $S + \frac{\pi}{6}$, then find b.

30. If the point $\left(-\frac{2}{3}, \frac{\sqrt{5}}{3}\right)$ on the unit circle corresponding to arc length $3\pi - S$, then find $\cos(S + \pi)$.

3 Section 6.3

1. If $\sin t = -\frac{1}{4}$, then find $\cos 2t$.

2. Find the maximum value of the function $y = 6\sin 2t \sin\left(\frac{\pi}{2} - 2t\right)$.

3. If $\cos^2 2\theta = \frac{1}{2}(1 + 2k\cos t\theta)$, then find the values of k and t.

4. Find the period of $f(x) = \sin 2x \cos 2x$.

5. Verify the identity

(a) $\cot 2x = \frac{\cos^4 x - \sin^4 x}{2 \sin x \cos x}$

(b) $2 \csc 2\theta = \tan\theta + \cot\theta$

(c) $\frac{1-\tan^2\beta}{1+\tan^2\beta} = \cos 2\beta$

6. Which one of the following is an identity:

(a) $\sin x + \cos x = 1$

(b) $\csc^2 x + 1 = \cot^2 x$

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

(d) $\cos \frac{x}{2} = \sqrt{\frac{1+\cos x}{2}}$

(e) $\sin(x - y) = \sin x - \sin y$

7. $\sqrt{\frac{1+\cos 200^\circ}{2}} =$ $a) \cos 80^0$ $b) -\sin 100^\circ$ $c) \sin 100^\circ$ $d) -\cos 80^\circ$ $e) \cos 100^\circ$

8. $-\frac{\tan \frac{x}{4}}{2-2\tan^2 \frac{x}{4}} =$ $a) -\frac{1}{2}\tan \frac{x}{8}$ $b) \frac{1}{2}\tan \frac{x}{2}$ $c) -\tan \frac{x}{2}$ $d) \frac{1}{4}\tan\left(-\frac{x}{2}\right)$

9. $\sqrt{\frac{1-\cos 400^\circ}{2}} =$ $a) \cos 400^\circ$ $b) \sin 200^\circ$ $c) \sin 20^\circ$ $d) -\cos 200^\circ$ $e) \cos 20^\circ$

10. Simplify the following in terms of a single trigonometric function

(a) $\frac{2\sin 2\theta - \sin 4\theta}{2\sin 2\theta + \sin 4\theta}$

(b) $\frac{\sin 2\theta}{\sin\theta} - \frac{\cos 2\theta}{\cos\theta}$

(c) $\frac{2}{1+\cos\theta} - \tan^2 \frac{\theta}{2}$

(d) $\frac{1}{\sin^2 x + \cos 2x}$

11. If $\tan x = -\sqrt{8}$, $\frac{3\pi}{2} < x < 2\pi$,then find $\cos \frac{x}{2}$.

12. If $\left(-\frac{3}{5}, -\frac{4}{5}\right)$ is the point on the unit circle corresponding to arc length t, then find the point corresponding to arc length $2t$.

13. If $\cos x = \frac{1}{3}$, then find $\cos 2x$.

14. $\frac{4\tan 2x}{1+\tan^2 2x} =$ $a) 2\cos 4x$ $b) 2\cos\left(\frac{\pi}{2} - 4x\right)$ $c) 2\cos 2x$ $d) 2\sin 2x$ $e) \sin 4x$

15. If $\sin\theta = \frac{1}{4}$, $\frac{\pi}{2} < \theta < \pi$, then find $\sin 2\theta$.

16. Given $\cos\theta = -\frac{3}{5}$ and θ terminates in quadrant II, then find $\tan \frac{\theta}{2}$.

17. If $\tan\theta = \frac{4}{3}$, which one of the following must be TRUE? $a) \sin 2\theta = \frac{24}{25}$ $b) \sin\theta > \cos\theta$ $c) \cot(\theta - \pi) = -\frac{3}{4}$ $d) |\sin\theta - \cos\theta| = 1$ $e) \cot 2\theta = \frac{25}{24}$

18. If $3 - 3\cos 4\theta = k\sin^2 t\theta$, then find the values of k and $|t|$.

19. On the unit circle, if the arc length $\frac{\pi}{12}$ terminates at the point (a, b), then find ab.

20. If $5\sin^2 5\theta - 5\cos^2 5\theta = 2k\cos t\theta$, then find the values of k and t.

21. $\sqrt{\frac{1-\sin 440^\circ}{2}} =$ $a)\cos 5^\circ$ $b)\sin 5^\circ$ $c)\cos 175^\circ$ $d)\sin 95^\circ$ $e)\sin 220^\circ$

22. $\frac{2\sin\theta - \sin 2\theta\cos\theta}{2\sin\theta(1-\sin^2\theta)} =$ $a)1+\tan^2\theta$ $b)\cos 2\theta$ $c)\tan 2\theta$ $d)\sec^2\theta - 1$ $e)\sec\theta$

23. Find the value of $\cos\frac{17\pi}{3} + (\sin 75^\circ + \cos 75^\circ)^2$

24. If $\frac{\sin^3 x + \cos^3 x}{\sin x + \cos x} = 1 + k\sin tx$, then find the values of k and t.

25. If $\cos 2\theta = \frac{7}{25}$, where $\frac{3\pi}{2} < 2\theta < 2\pi$, then find $\cos\theta$.

26. If $\tan x = -\frac{1}{2}$, $\frac{\pi}{2} < x < \pi$, then find $\cos\left(\frac{\pi}{2} - 2x\right)$.

27. Find the value of $\left(\sin\frac{\pi}{12} + \cos\frac{\pi}{12}\right)^2$.

28. If $\tan\theta = -\frac{3}{4}$, and $90^\circ < \theta < 180^\circ$, then find $\cos\frac{\theta}{2}$.

29. Which one of the following is an identity?

    (a) $\cos^2 x - \sin^2 x = \sin 2x$
    (b) $\cos(-x)\sec x = -1$
    (c) $\cos^2\frac{x}{2} - \sin^2\frac{x}{2} = \cos x$
    (d) $\tan^2 x - \sec^2 x = 1$
    (e) $\frac{1}{2}\sin 2x = \sin x$

30. $\sin\frac{x}{2} = -\sqrt{\frac{1-\cos x}{2}}$ is an identity if $a)0 \le x \le 2\pi$ $b)0 \le x \le \pi$ $c)\pi \le x \le 2\pi$ $d)2\pi \le x \le 4\pi$ $e)\pi \le x \le 3\pi$

31. Find the exact value of

    (a) $\tan\frac{7\pi}{8}$
    (b) $\sin\frac{\pi}{12}\cos\frac{\pi}{12}$

32. If $\cot\alpha = -\frac{3}{4}$, α in quadrant IV, and $\sec\beta = -\frac{13}{12}$, β in quadrant III, then find $\csc(\alpha+\beta)$ and $\cos\frac{\alpha}{2}$.

33. If $\cos\theta = \frac{3}{5}$, $\sin\theta < 0$, $0 \le \theta \le 2\pi$, then find $\tan\frac{\theta}{2}$.

34. Find the exact value of $\tan 15^\circ$.

35. $-\sqrt{\frac{1+\cos 378^\circ}{2}} =$ $a)-\cos 189^\circ$ $b)\sin 189^\circ$ $c)-\sin 189^\circ$ $d)-\tan 189^\circ$ $e)\cos 189^\circ$

36. $\sin 80^\circ$ is equal to $a)\sqrt{\frac{1+\cos 920^\circ}{2}}$ $b)\sqrt{\frac{1+\cos 880^\circ}{2}}$ $c)\sqrt{\frac{1-\cos 880^\circ}{2}}$ $d)\sqrt{\frac{1-\cos 40^\circ}{2}}$

37. Find the exact value of $\sin\frac{\alpha}{2}$, when $\csc\alpha = -\frac{5}{3}$, $\frac{7\pi}{2} < \alpha < 4\pi$.

38. The expression $2\csc x\cos\frac{x}{2}$ simplifies to: $a)\sec\frac{x}{2}$ $b)\tan\frac{x}{2}$ $c)\cot\frac{x}{2}$ $d)\csc\frac{x}{2}$

39. If $0 \leq \alpha < 2\pi$, then find the value of $\sec \frac{x}{2}$ given that $\cos \alpha = \frac{4}{5}$ and α is in quadrant IV.

40. Find the exact value of $\tan(-22.5°)$.

41. If $\sin \theta = \frac{4}{5}$ and θ in quadrant II, then find $\cot 2\theta$

42. Find the value of $\cos 13° \cos 9.5° - \sin 13° \sin 9.5°$.

43. If $\cos(-\theta) = \frac{-1}{\sqrt{5}}$, and $\csc \theta < 0$, then evaluate $\cos 3\theta$.

44. If $\cot A = \frac{2}{\sqrt{5}}$, and $\cos A < 0$, then find $\cos \frac{A}{2}$.

45. Select the value of each expression in list I, from the values listed in List II.

List I	List II
1. $\cos\left(\frac{2n+1}{2}\pi\right)$, $n = 0, \pm 1, \pm 2$	a) 1
2. $\sec^2 20 - \tan^2 20$	b) $-\sqrt{3}$
3. $\sqrt{\frac{1-\cos 40}{2}}$	c) $\tan 120°$
4. $\frac{\tan 115° + \tan 5°}{1 - \tan 115° \tan 5°}$	d) 0
5. $\cot 20° \sec 20°$	e) $\cos 20°$
	f) $\csc 20°$
	g) $\cos 70°$

4 Section 6.4

1. Which one of the following is TRUE for $f(x) = \sin x + \cos x$?

   (a) $f(x)$ is even.
   (b) $f(x)$ is odd
   (c) The maximum value of $f(x)$ is $\sqrt{2}$
   (d) The Amplitude of $f(x)$ is 2
   (e) The period of $f(x)$ is 4π

2. Find the minimum value of $f(x) = 5 \sin x + 12 \cos x$

3. When using the reduction identity, then find the Phase Shift of $y = -3 \sin 2x + 3 \cos 2x$.

4. If $2 \sin x - 2\sqrt{3} \cos x = k \sin(x + t)$, then find k and t.

5. Which one of the following is equivalent to $y = 3 \sin x - 3 \cos x$?

   (a) $y = 3 \sin x$
   (b) $y = 3\sqrt{2} \cos\left(x - \frac{\pi}{4}\right)$
   (c) $y = \sqrt{2} \sin 3x$
   (d) $y = \sqrt{2} \cos 3x$

(e) $y = 3\sqrt{2}\sin\left(x - \frac{\pi}{4}\right)$

6. Find the range of the function $f(x) = \sin 3x + \cos 3x$.

7. Using the reduction identity, the expression $\frac{\sqrt{3}}{2}\sin x - \frac{1}{2}\cos x =$
$a)\cos\left(x - \frac{\pi}{6}\right)$ $b)\sin\left(x + \frac{\pi}{3}\right)$ $c)\sin\left(x - \frac{\pi}{3}\right)$ $d)\sin\left(x + \frac{\pi}{6}\right)$ $e)\sin\left(x - \frac{\pi}{6}\right)$

8. When $y = \cos x - \sqrt{3}\sin x$ is expressed in the form $y = a\sin(x + \alpha)$ where $0 \leq \alpha \leq 2\pi$, then find a and α.

9. Find the Amplitude and the Period of the function $y = 3\sin\frac{x}{2} + 4\cos\frac{x}{2}$.

10. Given $g(x) = \sin 3x - \cos 3x + 2$. Find the range and the phase shift of the graph of $g(x)$.

11. When writing $-\sin x - \sqrt{3}\cos x$ in the form $A\sin(x + \alpha)$, $0 \leq \alpha \leq 2\pi$, find A, and α.

12. Using the reduction identity, rewrite $f(x) = \frac{\sqrt{3}}{2}\sin 2x - \frac{1}{2}\cos 2x$. Also, find a)range of f b)period of f c)amplitude of f d)phase shift of f.

13. Rewrite the function $f(x) = \sin x - \sqrt{3}\cos x$ in the form $k\sin(x + \alpha)$. Then find the amplitude, the period and the phase shift of the graph of $f(x)$.

14. If the amplitude of the function $f(x) = \sqrt{3}\sin(2x) + 2\cos(2x)$ is A and the period is B, then find $\frac{A^2}{\pi}B$.

15. Find the maximum value of the function $f(x) = 3\sin x - 4\cos x$.

16. Apply the reduction identity on the function $y = \sqrt{3}\sin 4x - \cos 4x$ to find its a)amplitude b)period c)phase shift d)range.

5 Section 6.5

1. Write $\sec(\arccos x) + \sin(\arccos x)$ in terms of x.

2. Find the domain and the range of the function $y = \arcsin(2x) + \frac{\pi}{2}$.

3. Find the value of $\cos\left(\arctan\left(-\frac{1}{4}\right)\right)$.

4. Find the domain and the range of the function $y = \arcsin(3x + 1) - \pi$

5. Find the value of $\tan\left[\arcsin\left(\frac{3}{5}\right) + \arccos\left(-\frac{4}{5}\right)\right]$

6. Find the value of $\sin\left[\frac{\pi}{2} - \arcsin\left(\frac{4}{5}\right) + \arctan\left(-\frac{3}{4}\right)\right]$

7. Which one of the following is TRUE for all values for which the variables are defined?

   (a) $2\arccos(x) = \arccos(2x)$

   (b) If $y = \arcsin(x + 2)$, then $x = -2 + \sin y$

   (c) $\arctan x = \frac{\arcsin x}{\arccos x}$

   (d) $y = \arcsin x$ is an even function

   (e) $arccotx = \frac{1}{\arctan x}$

8. Find the domain and the range of the function $y = \cos(\arcsin 2x)$
9. Find the value of $arccsc\left(\frac{1}{\sin\frac{3\pi}{4}}\right)$
10. The adjacent figure represents the graph of:
    (a) $y = 3\cos^{-1}\frac{x}{2}$
    (b) $y = 2\sin^{-1}3x$
    (c) $y = \frac{1}{2}\cos^{-1}3x$
    (d) $y = 3\sin^{-1}\frac{x}{2}$
    (e) $y = \frac{1}{2}\cos^{-1}\frac{x}{3}$
11. Write $\cos\left[\tan^{-1}\frac{\sqrt{1-x^2}}{x}\right]$ in terms of x.
12. Find the value of $\tan\left[\frac{\pi}{4} - \sec^{-1}\left(-\frac{5}{4}\right)\right]$
13. Find the value of $\cos^{-1}\left(-\frac{1}{2}\right) + \sin^{-1}\left(\sin\frac{7\pi}{6}\right)$
14. Find the value of $\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right) + \sin^{-1}\left(-\frac{\sqrt{3}}{2}\right)$
15. Find the domain and the range of the function $f(x) = -3\sin^{-1}(2x-1)$
16. Find the solution of the equation $\sin^{-1}\frac{3}{5} + \cos^{-1}x = \pi$
17. The sum of all positive value of x and y which satisfy the equation $\cos\left(\arcsin x + \arccos\sqrt{1-y^2}\right) + \cos\left(\arcsin x - \arccos\sqrt{1-y^2}\right) = 0$ is:
    a)1 b)4 c)2 d)8 e)none of the above
18. Find the solution of the equation $\arcsin x + \arcsin\left(-\frac{20}{29}\right) = \arcsin\left(\frac{21}{29}\right)$
19. Find $\tan^{-1}\left(\tan\frac{9\pi}{5}\right)$
20. Find the exact value of $\sin\left(\frac{4\pi}{3} + \tan^{-1}(-3)\right)$
21. Find the exact value of $\sin^{-1}\left(\sin\frac{9\pi}{5}\right)$
22. Solve: $\sin^{-1}x - \tan^{-1}\left(-\frac{5}{12}\right) = \pi$
23. Evaluate $\sin\left(2\sin^{-1}\left(-\frac{3}{5}\right)\right)$
24. Which one of the following statements is TRUE?
    (a) The function $f(x) = x + \sin x$ is periodic
    (b) The amplitude of $y = \frac{3}{2}\cot\left(5x - \frac{\pi}{2}\right) + 2$ is $\frac{3}{2}$
    (c) The graph of $y = \sec x$ has a maximum value when $\frac{\pi}{2} < x < \frac{3\pi}{2}$
    (d) The equation $\arctan x = \frac{3\pi}{4}$ has a real solution

25. Find the value of $\sin^{-1}\left(\sin\frac{4\pi}{3}\right)$

26. The equation $\cos^{-1}(x)+\sin^{-1}(3+4x)=\frac{\pi}{2}$ has:
    (a) Exactly one solution which is a negative integer.
    (b) Two real solutions.
    (c) A solution $x\in(-3,-2)$.
    (d) A solution $x\in(0,1]$.
    (e) No solution at all.

6 Section 6.6

1. Find the solution set of the following:
    (a) $\cos 2x+\cos x=0$ in the interval $0\le x\le 2\pi$.
    (b) $2-2|\cos x|=1$ with $0\le x\le\frac{3\pi}{2}$.
    (c) $2\sin x-\cos 2x=\frac{1}{2}$ where $0\le x<\pi$.
    (d) $\cos^2 2x-2\cos 2x=3$ in the interval $\pi\le x\le 4\pi$.
    (e) $\sin\frac{x}{2}+\cos x=1$ in the interval $0\le x\le\pi$.
    (f) $\sin 4x=\sin 2x$ where $0\le x<2\pi$.
    (g) $6\sec^2 x-\sec x=1$ where $0\le x<2\pi$.
    (h) $2\sin x-1-\csc x=0$ where $0\le x<2\pi$.
    (i) $\sin x\tan^2 x=\sin^2 x-\sin x$ where $0\le x<2\pi$.
    (j) $\sin 4x\cos x-\cos 4x\sin x=1$ where $0\le x<2\pi$.
    (k) $\sqrt{2}\sin 2x=1$ in the interval $[0,2\pi)$.
    (l) $2\cos 3x-2\sec 3x+3=0$ in the interval $[0,\pi)$.
    (m) $3\sin x=\sqrt{2}+\sin x$ where $0\le x<\pi$.
    (n) $2\sin x\cos x=\sqrt{3}\cos x$ in the interval $[0°,360°)$.
    (o) $2\cos^2 x-2\sin^2 x=\sqrt{3}$ in the interval $[0,\pi)$.
    (p) $\sec\theta+1=\tan^2\theta$ where $0\le x<2\pi$.
    (q) $3\cot^3\theta=\cot\theta$ in the interval $\left[\frac{\pi}{3},\frac{3\pi}{2}\right]$.
    (r) $3\sec^2\frac{x}{2}=4$ in the interval $[0,2\pi)$.
    (s) $\tan t\sin t=\sqrt{3}\tan t$ in the interval $[30°,210°]$.
    (t) $\csc\frac{x}{2}=\sqrt{2}$ in the interval $(\pi,6\pi)$.
    (u) $\sin 3x-\sin x=\cos 2x$ in the interval $(0°,360°)$.
    (v) $\cos^2\frac{x}{2}-\sin^2\frac{x}{2}=-\frac{\sqrt{3}}{2}$ where $0\le x<2\pi$

2. Find the points of intersection between the graph of $y=2\sin\left(\frac{x}{2}\right)$ and the line $y=1$ on the interval $0\le x\le 2\pi$.