Week 14 Monday

April 8, 2019 7:57 AM

Average = 79%

Quiz tomorrow 8.2

Omit Sections 13.2 and 13.3

Updated Formula Sheet

Omit Sugg HW 13.1 # 75, 79

Exam Breakdown:

29 Questions

92 Marks Total

Ch	% of Marks
1	11
2 and 11.3	7
3	10
4	10
5	11
6	22
7	12
8	10
13.1	7

Logarithms / Exponential Functions

Trig / Inverse Trig

8.6 Double Angle Formulas

Recap $\sin 2\theta = 2\sin\theta\cos\theta$

Ex: Solve $\sin\theta\cos\theta = -\frac{1}{4}$, $0 \le \theta < \pi$

$$2\sin\theta\cos\theta = -\frac{1}{2}$$

$$\sin 2\theta = -\frac{1}{2}$$

Let $x = 2\theta$: $\sin x = -\frac{1}{2}$

$0 \le \theta < \pi$

$0 \le 2\theta < 2\pi$

$0 \le x < 2\pi$

Solve $\sin x = -\frac{1}{2}$ on $0 \le x < 2\pi$

# of solutions: 2

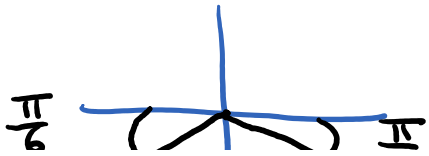
reference angle: $\sin x = \frac{1}{2}$

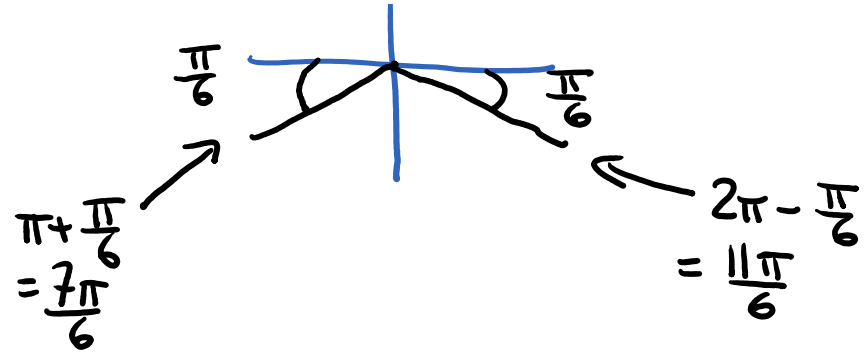
$x = \frac{\pi}{6}$

CAST Rule:

Want $\sin x < 0$

Solve:





$2\theta = x = \frac{7\pi}{6}, \frac{11\pi}{6}$

$\theta = \frac{7\pi}{12}, \frac{11\pi}{12}$

13.1 Sequences and Series

Sequence: ordered list of numbers

e.g. $2, 4, 6, 8, \ldots$

$a_1, a_2, a_3, a_4, \ldots$

a_3 is the 3rd term

Ex: Find the 1st four terms

a) $\{a_n\} = \left\{\frac{(-1)^{n+1} e^n}{2}\right\}$

1st term: sub $n=1$

$a_1 = \frac{(-1)^2 e^1}{2} = \frac{e}{2}$

2nd term: sub $n=2$

$a_2 = \frac{(-1)^3 e^2}{2} = -\frac{e^2}{2}$

$$a_3 = \frac{(-1)^4 e^3}{2} = \frac{e^3}{2}$$

$$a_4 = -\frac{e^4}{2}$$

$$\frac{e}{2}, -\frac{e^2}{2}, \frac{e^3}{2}, -\frac{e^4}{2}, \frac{e^5}{2}, \cdots$$

b) $\{c_n\} = \left\{\frac{n+1}{n+3}\right\}$

1st term: $c_1 = \frac{2}{4}$ $\left(= \frac{1}{2}\right)$

$$c_2 = \frac{3}{5}$$

$$c_3 = \frac{4}{6}$$

(Sub $n=4$) $c_4 = \frac{5}{7}$

$$\frac{2}{4}, \frac{3}{5}, \frac{4}{6}, \frac{5}{7}, \cdots$$

Ex: Find the 1st 5 terms

a) $b_1 = 1$ $b_2 = 1$ $b_n = b_{n-1} + b_{n-2}$ $(n \geq 3)$

$b_1 = 1$

$b_2 = 1$

(Sub $n=3$) $b_3 = b_2 + b_1 = 2$

$b_4 = b_3 + b_2 = 3$

$b_5 = b_4 + b_3 = 5$

$1, 1, 2, 3, 5, 8, 13, 21, \cdots$

b) $a_1 = 2 \qquad a_n = \frac{a_{n-1}}{n} \quad (n \geq 2)$

$a_1 = 2$

(Sub $n=2$) $a_2 = \frac{a_1}{2} = 1$

$a_3 = \frac{a_2}{3} = \frac{1}{3}$

$a_4 = \frac{a_3}{4} = \frac{1}{4}\left(\frac{1}{3}\right) = \frac{1}{12}$

$a_5 = \frac{a_4}{5} = \frac{1}{5}\left(\frac{1}{12}\right) = \frac{1}{60}$

$2, 1, \frac{1}{3}, \frac{1}{12}, \frac{1}{60}, \cdots$

Ex: Write down a_n
(Write down the n^{th} term)

a) $-4, 4, -4, 4, -4, \cdots$

$a_n = (-1)^n 4$

Alternatively:

$a_n = -a_{n-1} \quad (n \geq 2)$

$a_1 = -4$

b) $1, \frac{1}{3}, \frac{1}{9}, \frac{1}{27}, \cdots$

$a_1 = 1$

$a_n = \frac{1}{3} a_{n-1} \quad (n \geq 2)$

"recursive formula"

OR

$a_n = \frac{1}{3^{n-1}}$ or $a_n = \left(\frac{1}{3}\right)^{n-1}$

"closed formula"

c) $\frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7}, \ldots$

$a_n = \frac{n+2}{n+3}$