SHEET.

NAME______________________ MAT. NO.__________

1. Express $\sin 4\theta + \sin 6\theta$ as a product of sines and cosines

(a) $2\sin 4\theta\cos 2\theta$ (b) $2\sin\theta\cos 5\theta$ (c) $\sin 5\theta\cos\theta$ (d) $2\sin 5\theta\cos\theta$ (e) None of the above

2. Evaluate $\tan\left(2\theta + \frac{\pi}{2}\right)$ (a) $-\cot 2\theta$ (b) $\cot 2\theta$ (c) $-\operatorname{cosec} 2\theta$ (d) $\operatorname{cosec} 2\theta$ (e) None of the above

3. If $Z_1 = 2+5i$, $Z_2 = 8-2i$, find Z_1Z_2 (a) $16+44i$ (b) $16-44i$ (c) $26-36i$ (d) $26+36i$ (e) None of the above

4. Express $(4-i)(2+5i)-(6+3i)(2-2i)$ in the form of a+ib

(a) $-5+24i$ (b) $-5-24i$ (c) $5+24i$ (d) $5-24i$ (e) None of the above

5. If $\sum_{1}^{n}\frac{1}{r(r+1)} = \frac{n}{n+1}$ is proved by induction then the principle at $n=k+1$ is done by simplifying...

(a) $\frac{1}{k(k+1)} + \frac{k}{K+1}$ (b) $\frac{k}{k+1} + \frac{1}{(k+1)(k+2)}$ (c) $\frac{k+1}{k+2}$ (d) $\frac{k+1}{k+2} + \frac{k}{k+1}$ (e) none of the above

6. A free falling body, starting from rest falls 16ft during the first second, 48 ft during the second, 80 ft during the third second etc. Calculate the distance it falls in 15 seconds from rest. (a) 448 (b) 432 (c) 464 (d) 496 (e) none of the above.

7. Solve the inequality $Log_3(x^2 + 13x + 67) < 3$ (a) x < -5 or x < -8 (b) -5 < x< 5 (c) -5 < x <8 (d) 5 < x< 7

(e) none of the above

8. Which of the following is not a step in the principle of mathematical induction in establishing the veracity of a formula for the sum of a series? (a) Assume that the mathematical expression is true for n = k, if it is true for n = 1 (b) Show that the mathematical expression is true for n =1 (c) Assume that the mathematical expression is true for n = k +1 (d) If the mathematical expression is true for n = k, then show that it is true for n = k + 1.
(E) None of the above

If α and β are the roots of the equation $-5+6x+2x^2=0$, form the equation whose roots are $\alpha+\frac{1}{\beta}, \beta+\frac{1}{\alpha}$.

(a) $x^2+2x+5=0$ (b) $6x^2+5x-1=0$ (c) $10x^2+18x-9=0$ (d) $14-3x-2x^2=0$ (e) none of the above.

10. Given $y=14-3x-2x^2$, state the type of turning point and determine the turning point. (a) Minimum point, $\left(\frac{1}{4}, \frac{-81}{8}\right)$ (b) maximum point, $\left(\frac{1}{4}, \frac{-81}{8}\right)$ (c) maximum point, $\left(\frac{-3}{4}, \frac{21}{8}\right)$ (d) Minimum point, $\left(\frac{-1}{4}, \frac{3}{8}\right)$ (d) none of the above

11. Find an expression for the last term, U_n of the sequence 3, 5, 7, 9, … (a) $(n+1)^2$ (b) $2n+1$ (c) $(2n)^2$ (d) $2(n+1)$ (e) none of the above

12. Evaluate: $\sum_{r=3}^{7} 2^r$ (a) 252 (b) 248 (c) 254 (d) 244 (e) none of the above

13. Find the nth term of AP whose sum to n terms is $n(n+2)$ for all n. (a) 2n +1 (b) 2n+2 (c) 2n+3 (d) 2(n+2) (e) none of the above.

Use the information below to answer question 14 - 15

There are 40 pupils in a class. 30 of them study Biology, 22 study Physics and 21 study Chemistry. 15 study Physics and Biology, 10 study Physics and Chemistry and 13 study Biology and Chemistry. Each student in the class studies at least one of the three subjects.

14. How many pupils study all the three subjects? (a) 10 (b) 9 (c) 5 (d) 55 (e) none of the above.
15. If a pupil is selected at random, what is the probability that he studies either Physics or Chemistry? (a) $\frac{33}{40}$ (b) 33 (c) 13 (d) 1 (e) none of the above

16. Let S={1,2,3,4,5,6}, T= {2,4,5,7}, and R={1,4,5}. Then find $(S\cap T)\cup R$ (a) {4,5} (b) {2,4,7} (c) {1,2,3,4,5} (d) {2,4,5} (e) none of the above.

17. If α and β are the roots of the equation $2x^2+6x-5=0$, form the equation whose roots are $\frac{\alpha}{\beta}, \frac{\beta}{\alpha}$.
(a) $5x^2+28x+5=0$ (b) $10x^2+18x-9=0$ (c) $x^2+x-5=0$ (d) $2x^2-15x+6=0$ (e) none of the above.

18. A binary operation * is defined on the set of real number R by $x*y=\sqrt{x+y-\sqrt{x-y}}$ where $x, y \in R$, the value 9*2 is (a) $\sqrt{6}$ (b) 9 (c) $\sqrt{3}$ (d) $\sqrt{9}$ (e) none of the above.

19. The operation $\circ$ is defined over the set of real number R by $\left(a\circ b=a+b+\frac{1}{2}ab\right)$. Find $(2\circ 3)\circ 4$ (a) 28 (b)54 (c) 10 (d)12 (e) none of the above.

20. Find the value of $\cot x+2\operatorname{cosec} x+\cos x\sec x$, if $\sin x=\frac{3}{5}$, $0^0<x<90^0$.

(a) $\frac{3}{17}$ (b) $\frac{17}{3}$ (c) $\frac{13}{3}$ (d) $\frac{3}{13}$ (e) None of the above

21. Given that $\tan x = \frac{3}{5}$, evaluate $\frac{\sin x + 2\cos x + 3}{4\sec x}$, $0^\circ \le x < 90^\circ$.

(a) $\frac{13+3\sqrt{34}}{34}$ (b) $\frac{13-3\sqrt{34}}{34}$ (c) $\frac{65+15\sqrt{34}}{136}$ (d) $\frac{65-15\sqrt{34}}{136}$ (e) None of the above

22. Evaluate $(1-\cos^2\theta)\operatorname{cosec}^2\theta$ (a) 1 (b) -1 (c) 2 (d) -2 (e) None of the above

23. If $\sin A = \frac{4}{5}$ and $\cos B = \frac{3}{5}$, find $\cos(A+B)$ (a) $\frac{25}{7}$ (b) $-\frac{25}{7}$ (c) $\frac{7}{25}$ (d) $-\frac{7}{25}$ (e) None of the above

24. Evaluate $\frac{\sin^2 2\theta}{\cos^2\theta}$ (a) $4-4\cos^2\theta$ (b) $4+4\cos^2\theta$ (c) $2\sin^2\theta$ (d) $4\cos\theta$ (e) None of the above

25. Mr. Daniel got an employment offer with a starting salary of N500,000 per annum with a yearly increase of N20,000. Calculate his salary at the 10th year. (a) N600,000 (b) N645,000 (c) N680,000 (d) N720,000 (e) none of the above

26. An exponential sequence (GP) is given by 8, 2, ½, ... Find in terms of n, the nth term. (a) 2^{n+1} (b) 2^{5+2n} (c) 2^{-2n} (d) $32(2)^{-2n}$ (e) none of the above

27. The p-series $\sum_{n=1}^{\infty} \frac{1}{n^p}$ is convergent if.... (a) p <1 (b) p>1 (c) p = 1 (d) $p \le 1$

28. Find x if (a) $|3x-4| < 9$. (a) $\frac{5}{3} < x < \frac{13}{3}$ (b) $-\frac{5}{3} < x < \frac{13}{3}$ (c) $\frac{5}{3} < x < -\frac{13}{3}$ (d) $-\frac{5}{3} < x < -\frac{13}{3}$ (e) none of the above

29. Which of the following statements is/are correct? (I) All integers are rational numbers (II) The set of positive integers is equal to the set of natural numbers (III) All real numbers are complex numbers (IV) The set of non-negative integers is equal to the set of natural numbers. (a) I, II, IV (b) I, II, III, IV (c) II, III, IV (d) I, II, III (e) none of the above

30. Evaluate $\tan 4\theta$ (a) $\frac{4\tan\theta(1-\tan^2\theta)}{1+6\tan^2\theta-\tan^4\theta}$ (b) $\frac{4\tan\theta(1-\tan^2\theta)}{1-6\tan^2\theta+\tan^4\theta}$ (c) $\frac{\tan\theta(1-\tan^2\theta)}{1+6\tan^2\theta-\tan^4\theta}$ (d) $\frac{\tan\theta(1-\tan^2\theta)}{1-6\tan^2\theta+\tan^4\theta}$ (e) None of the above

Determine the values of $\log(1+i)$. (a) $\log\sqrt{2} + i\left(\frac{\pi}{4}+2\pi i\right)$ (b) $\log\sqrt{2} + i\left(\frac{\pi}{4}-2\pi i\right)$ (c) $\log\sqrt{2}$ (d) $\log\sqrt{2} - i\left(\frac{\pi}{4}+2\pi i\right)$ (e) None of the above

Express $\frac{x+7}{x^2-16}$ in partial fractions (a) $\frac{x+7}{(x-4)(x+4)}$ (b) $\frac{11}{8(x-4)} - \frac{3}{8(x+4)}$ (c) $\frac{1}{(x-4)} + \frac{1}{(x+4)}$

MTH101

1. $\sin 4\theta + \sin 6\theta$
using $\sin A + \sin B = 2\sin\left(\frac{A+B}{2}\right)\cos\left(\frac{A-B}{2}\right)$
$\therefore \sin 4\theta + \sin 6\theta = 2\sin\left(\frac{4\theta+6\theta}{2}\right)\cos\left(\frac{4\theta-6\theta}{2}\right)$
$= 2\sin\frac{10\theta}{2}\cos\left(\frac{-2\theta}{2}\right)$
$= 2\sin 5\theta\cos(-\theta)$
$= 2\sin 5\theta\cos\theta$ // D//

2. $\tan\left(2\theta + \frac{\pi}{3}\right)$
using
$\tan\theta = \cot(90-\theta)$, $90° = \pi/2$ rad
$\tan\left(2\theta+\frac{\pi}{3}\right) = \cot\left(\frac{\pi}{2} - \left(2\theta+\frac{\pi}{3}\right)\right)$
$= \cot\left(\frac{\pi}{3} - 2\theta - \frac{\pi}{3}\right) = \cot(-2\theta)$
$= -\cot 2\theta$ A//

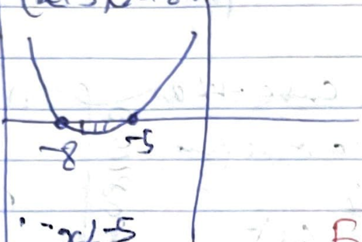
3. $Z_1 = 2+5i$, $Z_2 = 8-2i$
$Z_1Z_2 = (2+5i)(8-2i)$
$= 16 - 4i + 40i - 10i^2$
$= 26 + 36i$ // D//

4. $(4+i)(2+5i) - (6+3i)(2-2i)$
$= (8+20i-2i+5) - (12-12i+6i+6)$
$= (13+18i) - (18-6i)$
$= -5+24i$ // A//

5. $\sum_{1}^{n} \frac{1}{r(r+1)} = \frac{n}{n+1}$
At $n=k$
$\sum_{1}^{k} \frac{1}{r(r+1)} = \frac{k}{k+1}$
at $n=k+1$
$\sum_{1}^{k+1} \frac{1}{r(r+1)} = \frac{k}{k+1} + \frac{1}{(k+1)(k+1+1)}$
$= \frac{k}{k+1} = \frac{1}{(k+1)(k+2)}$ B//

6. The falls are in arithmetic progression
$16, 48, 80, \ldots$
$T_n = a + (n-1)d$
$T_{15} = a + 14d$, $d = 32$
$T_{15} = 16 + (14\times 32) = 464$. C

7. $\log_8(x^2+13x+87) < 3$
$x^2+13x+87 < 3^3$
$x^2+13x+40 < 0$
$(x+5)(x+8) < 0$



$\therefore x < -5$
$x > -8$ B//

8. C//

9. $-5 + 6x + 2x^2 = 0$
$2x^2 + 6x - 5 = 0$, $a=2, b=6, c=-5$,
$\alpha+\beta = \frac{-b}{a}$, $\alpha\beta = \frac{c}{a}$
$\alpha+\beta = \frac{-6}{2} = -3$, $\alpha\beta = -5/2$
$\alpha + \frac{1}{\beta}$ and $\beta + \frac{1}{\alpha} = ?$
$x^2 - (\text{sum of root})x + \text{product of root} = 0$
$x^2 - \left(\alpha+\frac{1}{\beta}+\beta+\frac{1}{\alpha}\right)x + \left(\alpha+\frac{1}{\beta}\right)\left(\beta+\frac{1}{\alpha}\right) = 0$
$x^2 - \left[(\alpha+\beta) + \frac{\alpha+\beta}{\alpha\beta}\right]x + \left(\alpha\beta + 2 + \frac{1}{\alpha\beta}\right) = 0$
$x^2 - \left(-3 + \frac{-3}{-5/2}\right) + \left(\frac{-5}{2} + 2 - \frac{2}{5}\right) = 0$
$x^2 - \left(\frac{-9}{5}x\right) - \frac{9}{10} = 0$
$10x^2 + 18x - 9 = 0$ C//

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10. $y = 14 - 3x - 2x^2$

turning point $\frac{dy}{dx} = 0$

$\therefore -3 - 4x = 0,\ 4x = -3$

$x = -3/4$

$\frac{dy}{dx} = -3 - 4x,\ \frac{d^2y}{dx^2} = -4$

For min point, $\frac{d^2y}{dx^2} > 0$

For max point $\frac{d^2y}{dx^2} < 0$

If $\frac{d^2y}{dx^2} = 0$ stationary point

Since $\frac{d^2y}{dx^2} = -4 < 0$, There exist a max point at $x = -3/4$

$y = 14 - 3\left(\frac{-3}{4}\right) - 2\left(\frac{-3}{4}\right)^2$

$y = 14 + \frac{9}{4} - \frac{2\times 9}{16} = \frac{121}{8}$

$\therefore \left(\frac{-3}{4}, \frac{121}{8}\right)$ is a max point B//

11. Linear sequence 3, 5, 7, 9 ...

$T_n = a + (n-1)d$

$T_n = 3 + (n-1)2$

$T_n = 2n+1$ B//

12. $\sum_{r=3}^{7} 2^r = 2^3 + 2^4 + 2^5 + \dots + 2^7$

$a = 2^3,\ r = \frac{2^4}{2^3} = 2$

$S_n = a\left(\frac{r^n - 1}{r-1}\right) = 2^3\left(\frac{2^5-1}{2-1}\right)$

$S_n = 8(31)$
$= 248$ B//

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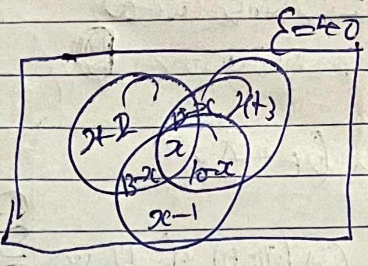
13. $S_n = n(n+2),\ S_{n-1} = (n-1)(n-1+2)$

$T_n = S_n - S_{n-1},\ S_{n-1} = (n-1)(n+1)$

$S_{n-1} = n^2 - 1,\ T_n = n(n+2) - (n^2-1)$

$T_n = n^2 + 2n - n^2 + 1 = 2n+1$ A//

14. $\xi = 40$



$n(B \cap P' \cap C') = 30 - (13 - x + x + 15 - x)$
$= x + 2$

$n(P \cap B' \cap C') = 22 - (15 - x + x + 10 - x)$
$= x + 5$

$n(C \cap P' \cap B') = 21 - (13 - x + x + 10 - x)$
$= x - 1$

$\therefore x + 2 + 13 - x + x + 15 - x + x - 1 + 10$

$-x + x - 3 = 0$

$x = 4$ B//

15. p (that a pupil studies either P or C)

$= p(A \cup B) = p(A) + p(B) - p(A \cap B)$

$p(P \cup C) = p(P) + p(C) - p(P \cap C)$

$= 4/40 + 3/40 + \frac{6}{40} + \frac{10}{40} + 1/4$ B//

16. $S = [1, 2, 3, 4, 5, 6]$, $P = (1, 4, \dots)$

$T = (2, 4, 5, 7)$. Find $(S \cap T) \cup P$

$S \cap T = 2, 4, 5$

$(S \cap T) \cup P = 1, 2, 4, 5$ B//

17. $2x^2 + 6x - 5 = 0$

$\alpha + \beta = -b/a$

$\alpha\beta = \frac{c}{a},\ \alpha + \beta = \frac{-6}{2} = -3$

$\alpha\beta = -5/2$

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The equation with root $\frac{\alpha}{\beta}, \frac{\beta}{\alpha}$

is: $x^2 - (S)x + P = 0$

$x^2 - \left(\frac{\alpha}{\beta} + \frac{\beta}{\alpha}\right)x + \left(\frac{\alpha}{\beta} \cdot \frac{\beta}{\alpha}\right) = 0$

$x^2 - \left(\frac{\alpha^2 + \beta^2}{\alpha\beta}\right)x + 1 = 0$

$x^2 - \left[\frac{(-3)^2 - 2(-5/2)}{-5/2}\right]x + 1 = 0$

$x^2 - (28/5)x + 1 = 0$

$x^2 - (28/5)x + 1 = 0$

$5x^2 + 28x + 5$ B

18. $x \ast y = (x+y) - \sqrt{x-y})^{1/2}$

$9 \ast 2 = \sqrt{6}$

19. $a \ast b = a + b + \frac{ab}{2}$

$(2 \ast 3) \ast 4 = 28 \ast 4 + \frac{28 \cdot 4}{2} = 28$

20 $\text{Cot}x + 2\text{Sec}x + \text{Cosec}x\text{Sec}x$

$\text{Sin}x = 3/5, 0^\circ < x < 90^\circ$

$\text{Cos}^2x + \text{Sin}^2x = 1, \text{Cos}^2x = 1 - \text{Sin}^2x$

$\text{Cos}x = \sqrt{1 - \text{Sin}^2x} = \sqrt{1 - \frac{9}{25}}$

$= 4/5$

$\text{Cosec}x = \frac{1}{\text{Sin}x} = 5/3$

$\text{Sec}x = 1/\text{Cos}x = 5/4$

Let x $\frac{\text{Cos}x}{\text{Sin}x} = \frac{4/5}{3/5}$

$= 4/3 + 1 + 5/2 = \frac{4}{3} + \frac{5}{3} + \frac{5}{2} + \frac{29}{6}$

B

21. $\text{Tan}x = 3/5, 0 < x < 90^\circ$

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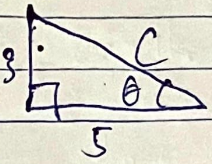

$c^2 = 5^2 + 3^2 = \sqrt{34}$

$\text{Sin}x = 3/\sqrt{34}, \text{Cos}x = 5/\sqrt{34}$

$\frac{\text{Sin}x + 2\text{Cos}x + 3}{4\text{Sin}x} = \frac{\frac{3}{\sqrt{34}} + \frac{10}{\sqrt{34}} + 3}{4\left(\frac{\sqrt{34}}{5}\right)}$

$= \frac{5(13 + 3\sqrt{34})}{131}$ C

22. $(1 - \text{Cos}^2\theta)\text{Cos}^2\theta = \text{Sin}^2\theta \frac{1}{\text{Sin}^2\theta}$

A

23. $\text{Sin}A = 4/5, \text{Cos}B = 3/5$

$\text{Cos}(A+B) = \text{Cos}A + B$

~~$\text{Sin}^2B = 1 \ldots$~~

$\text{Sin}^2B = 1 - \text{Cos}^2B = 1 - \frac{9}{25} = \frac{16}{25}$

D

24 $\frac{\text{Sin}^2 2\theta}{\text{Cos}^2\theta} = \frac{(\ldots)^2}{\text{Cos}^2\theta}$

$= 4\text{Sin}^2\theta = 4(1 - \text{Cos}^2\theta) = 4 - \text{Cos}^2\theta$

A

25 This salary is $r p = 500$

$a = 500{,}000, d = 20000, n = 10$

$U_n = a + (n-1)d, U_{10} = a + 9d$

~~$U_{10} = 500$~~ $U_{10} = 500{,}000 + 9 \times 20000$

$= 680{,}000$ C

26. The GP is $8, 2, \frac{1}{2}, \ldots$

$T_n = ar^{n-1}$ $r = 2/8 = 1/4$ $(1/2^2)^{n-1}$

$U_n = 2^3 (2^{-2})^{n-1} = 2 \cdot 2^{-2n+2}$

$= 32(2^{-2n})$ D

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(27) $\sum_{n=1}^{\infty} \frac{1}{n^p}$ is divergent if $p \le 1$, convergent if $p > 1$ (B)

(28) $|3x-4| < 9$ or $-9 < 3x-4 < 9$

$-9+4 < 3x < 9+4$, $-5 < 3x < 13$

$-5/3 < x < 13/3$ (B)

(29) Statement (III) is identical to statement (II). Statement I is also true. Ans (A)

(30) $\tan 4\theta = \frac{\sin 4\theta}{\cos 4\theta} = ?$

$(c+is)^4 = c^4 + 4c^3(is) + 6c^2(is)^2 + 4c(is)^3 + (is)^4 = c^4 - 6c^2s^2 + s^4 + (4c^3s - 4cs^3)i$

$(\cos\theta + i\sin\theta)^4 = \cos 4\theta + i\sin 4\theta$

(De Moivre's theorem)

$\sin 4\theta = 4\cos^3\theta\sin\theta - 4\cos\theta\sin^3\theta$

$\sin 4\theta = 4\sin\theta\cos\theta(\cos^2\theta - \sin^2\theta)$

$\cos 4\theta = \cos^4\theta - 6\cos^2\theta\sin^2\theta + \sin^4\theta$

$\therefore \tan 4\theta = \frac{4\sin\theta\cos\theta(\cos^2\theta - \sin^2\theta)}{\cos^4\theta - 6\cos^2\theta\sin^2\theta + \sin^4\theta}$

$= \dfrac{\dfrac{4\sin\theta\cancel{\cos\theta}(\cos^2\theta - \sin^2\theta)}{\cancel{\cos^3\theta}\cos^2\theta} \times}{\dfrac{\cos^4\theta - 6\cos^2\theta(1-\cos^2\theta) + (1-\cos^2\theta)^2}{\cos^3\theta}}$

$= \dfrac{4\sin\theta\left(\dfrac{\cos^2\theta}{\cos^2\theta} - \dfrac{\sin^2\theta}{\cos^2\theta}\right)}{\dfrac{\cos^4\theta - 6\cos^2\theta + 6\cos^4\theta + 1 - 2\cos^2\theta + \cos^4\theta}{\cos^3\theta}}$

(31) $= 4\sin\theta(1 - \tan^2\theta)$

$\tan 4\theta = \frac{\sin 4\theta}{\cos 4\theta} = \frac{4\cos^3\theta\sin\theta - 4\cos\theta\sin^3\theta}{\cos^4\theta - 6\cos^2\theta\sin^2\theta + \sin^4\theta}$

$= \dfrac{\dfrac{4\cos^3\theta\sin\theta}{\cos^4\theta} - \dfrac{4\cos\theta\sin^3\theta}{\cos^4\theta}}{\dfrac{\cos^4\theta}{\cos^4\theta} - \dfrac{6\cos^2\theta\sin^2\theta}{\cos^4\theta} + \dfrac{\sin^4\theta}{\cos^4\theta}}$

$= \frac{4\tan\theta - 4\tan^3\theta}{1 - 6\tan^2\theta + \tan^4\theta}$

$= \frac{4\tan\theta(1 - \tan^2\theta)}{1 - 6\tan^2\theta + \tan^4\theta}$ (B)

(31) $\log(1+i) = ?$ let $z = 1+i$

$|z| = \sqrt{1^2+1^2} = \sqrt{2}$, $\arg z = \tan^{-1}\left(\frac{1}{1}\right) = 45^\circ = \frac{\pi}{4}$, $\therefore 1+i = re^{i\theta}$

$1+i = |z|e^{i\theta} = \sqrt{2}e^{i\frac{\pi}{4}}$

$\log(1+i) = \log\left(\sqrt{2}e^{i\frac{\pi}{4}}\right)$

$= \log\sqrt{2} + \log e^{i\pi/4} = \log\sqrt{2} + i\frac{\pi}{4}$

$= \log\sqrt{2} + i\left(\frac{\pi}{4} + 2k\pi\right)$ (E) None of the above

(32) $\frac{x+7}{x^2-16} = \frac{x+7}{(x+4)(x-4)} \equiv \frac{A}{x+4} + \frac{B}{x-4}$

$x+7 \equiv A(x-4) + B(x+4)$ — *

set $x-4=0$, $x=4$, $11 = A(0) + B(8)$

$B = 11/8$, set $x+4=0$, $x=-4$

$\therefore -4+7 = A(-4-4) + B(0)$, $-8A = 3$

$A = -3/8$

$\therefore \frac{x+7}{x^2-16} = \frac{-3}{8(x+4)} + \frac{11}{8(x-4)}$ (B)

(33) $\frac{8x-17}{(x+1)(x-4)} = \frac{A}{x+1} + \frac{B}{x-4}$

$8x-17 \equiv A(x-4) + B(x+1)$ — *

set $x+1=0$, $x=-1$, $\therefore -8-17 = -5A$

$A = \frac{-25}{-5} = 5$, set $x-4=0$, $x=4$

$\therefore 8\times4 - 17 = B(4+1)$, $5B = 15$

$B = 3$.

$\therefore \frac{8x-17}{(x+1)(x-4)} = \frac{5}{x+1} + \frac{3}{x-4}$ (C)

(34) $\frac{x^3+3}{(x^2+2)^2} \equiv \frac{Ax+B}{x^2+2} + \frac{Cx+D}{(x^2+2)^2}$