

Mathematics 2013 (Enset Bambili)

1. $32^x = 0.25$, yields $e^{x \ln(0.25)}$ i.e $x = -0.4$ (C)
2. $u_0 = 2$, $u_8 = 256$, we write $u_8 = 2(q)^8$, does $q = 2$ (A)
3. $D_f = \mathbb{R} - \{\frac{4}{3}\}$ (A)
4. $(x-3)(x-4) < (x-3)$ yields $x^2 - 8x + 15 < 0$ does $3 < x < 5$
5. We obtain $z = \frac{2-i}{1-i}$ (A)
6. $\ln(\sqrt{5})$ (C)
7. When n tend to infinity, s_n tends to infinity (D)
8. $f''(x) = 0$ is equivalent to $x = 0$ or $x = 2$
9. $i^{1003} = -i$
10. $\log_{10}(x) = \frac{\ln x}{\ln 10}$ and we have $\log_{10}(10) = 1$ (B)
11. (B)
12. (A)
13. $k \leq 33$
14. $\frac{dy}{dx} + 5 = 6x$ yield $y = 3x^2 - 5x - 1$ (D)
15. $x = \frac{\Delta y}{\Delta x} = -\frac{1}{3}$
16. $A_8^8 = 8! = 40320$
17. 240 (D)
18. 120
19. $y = x + \frac{1}{2}$
20. $4[\frac{1}{3} \frac{(1-(\frac{1}{3})^\infty)}{\frac{2}{3}}] = 2$
21. (B)
22. $s_n = \frac{x^2}{3(x-3)}$ thus s_n exist iff $x \neq 3$
23. $\cos t = -\frac{1}{2}$ is equivalent to $\cos t = \cos \frac{2\pi}{3}$ yield $t = \frac{2\pi}{3} + 2n\pi$ or $t = -\frac{2\pi}{3} + 2n\pi$ ($n \in \mathbb{Z}$) (A)
24. $\text{tg} \alpha = \frac{5}{3}$ does $\alpha = 59^\circ$
25. $x^3 + y^3 = 10$, yields $y' = -x^2(10 - x^3)^{-\frac{2}{3}}$
26. $C_8^4 \times C_8^4 = 8820$
27. (C)
28. (C)
29. (D)
30. (D)
31. $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ (B)
32. Upper quartile
33.

x_i	0	1	2	3
$P(X = x_i)$	3c	2c	c	0

 $\sum P_i = 1$, thus $c = \frac{1}{6}$ (D)
34. (C)
35. $\frac{A_4^2 + A_5^2}{A_9^2} = \frac{4}{9}$ (D)