Answer Key for 41st MMPC Part I exam

1. d) \(\frac{\pi(1.1r)^2}{\pi r^2} = 1.21\) 2. d) New area = (0.7)^2 old area 3. e) \((-1)^{11} = -1, (-1)^n = 1, n>1\)

4. c) \(\left(\begin{array}{c}12 \\ 2 \end{array}\right)\) 5. a) 6. b) \(\frac{1/3\pi r^2 h - 1/3(1/2r)^2(1/2h)}{1/3\pi r^2 h}\) 7. e) Definition of hyperbola

8. a) 1997 = 3*665 + 2 = 3[3*221 + 2] + 2 etc. 9. e) 9x^2 + 1 = (9x + 1)^2

10. a) \(a^{1/2} = 6\) 11. d) Straight line in each quadrant

12. b) 275 = 11*5*5, 546 = 2*3*7*13, 819 = 3*3*7*13, 875 = 5*5*5*7, 988 = 2*2*13*19

13. c) look at first 2 coins \(\frac{4+6+6+4}{2^6}\) 14. b) square both sides twice and check

15. b) polynomial = 2(x-2)(x-3)(x-5) 16. a) Area = 1/2 h (2+8)

17. d) 1 - 2\(\cos^2 A = \cos A\) 18. c) \(\frac{14}{\pi 6^2} = \frac{A}{\pi 8^2}\) 19. e) \(4 = 8^{1/3}, 3 = 9^{1/2}\)

20. c) \(b^2 = c(a+1) = a(c+2)\) so \(c = 2a\) and \(2b = 3a\) and \(b^2 = 2/3b(4/3b + 2)\)

21. b) \(2\pi l.1.5N = 4*5280\) 22. c) D/d + D/4 = 1.5

23. a) \(x = \frac{-b + \sqrt{b^2 - 4ac}}{2a} = -\frac{b + c - a}{2a}\) 24. c) \(\frac{x}{y^3} = 10^6\)

25. a) \(kx^2 + mx - k\) has no solution if \(m^2 - 4k^2 < 0\)

26. e) \(\frac{5+5}{6^2}\) 27. c) Let \(r = 1\)

Let \(s = \frac{14(1/2)\sin 360^\circ}{14}\cos 360^\circ\pi\)

28. b) \(D = rt. 200*1000 (1/3600) t = 400\) 29. d) If \(x>0\) then \(x<2.5\) and if \(x<0\) then \(x> -5\)

30. b) \(\sqrt{6} + (t-1)/4 + (t-1.5)/3 = 1\) 31. d) \(x-4 = 2(y-4)\) and \(x + 7 + y + 7 = 79\)

32. b) Area = 1/2 FG (3 + 1) and \(FG = \sqrt{16 - 4}\) 33. c) \(\theta = \frac{s}{1318} 180 = \frac{3975}{\pi}\)

34. e) Take tangent of both sides to get \(\frac{M + N}{1 - MN} = \sqrt{3}\)
35. c) \( \frac{n(n+1)(2n+1)}{6} \cdot \frac{n(n+1)}{2} \)

36. e) \( \frac{1}{\cos A} = \tan^2 A \)

37. a) Mary doesn't play golf so Jim doesn't play tennis. Jim plays tennis and Bob doesn't play tennis is false. So Bob plays tennis and Ed doesn't play tennis is true.

38. e) Area = \( \frac{4\pi}{8} - \frac{\pi}{4} - \frac{1}{2} \)

39. b) \( x^2 = 2 + x \)

40. b) \( \frac{1/2 \cdot 2^{\sqrt{3}} - 3 \pi / 6}{\sqrt{3}} \)