1. B	11. D	21. A
2. E	12. B	22. A
3. B	13. A	23. C
4. B	14. E	24. A
5. B	15. B	25. C
6. E	16. B	26. A
7. B	17. D	27. C
8. D	18. D	28. C
9. D	19. E	29. D
10. C	20. D	30. B

1. B

$e^{i\theta} = rcis\theta$

$\frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}i, r = 1, \theta = \frac{-\pi}{4}$

$\left[e^{i\frac{-\pi}{4}} \right]^i = e^{\frac{\pi}{4}}$

$\left(\frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2}i\right)^6 = -i \quad \left(\frac{\sqrt{3}}{2} + \frac{1}{2}i\right)^6 = -1 \quad \left(\frac{1}{2} + \frac{\sqrt{3}}{2}i\right)^6 = 1 \quad \left(-\frac{\sqrt{3}}{2} + \frac{1}{2}i\right)^6 = -1$

2. E III only

3. B $14\sqrt{5}$

$Heron's: \sqrt{s(s-a)(s-b)(s-c)} = \sqrt{14(7)(5)(2)}$

4. B

$\left[\left(a^{\log_5 b}\right)\left(b^{\log_5 a}\right)\right]^{\log_b 5} = a^{\log_5 b \log_b 5} b^{\log_5 a \log_b 5}$

$a(a) = a^2$

5. B 72

6. E $\frac{-\pi}{6}$ $\tan x = \frac{-\sqrt{3}}{3}, Q4$

$15x + 10y = 90(25)$

7. B 225 -1.5x = $15x + 10y = 2250$

$y = 225 - 1.5x$

$2\cos^2 3x + \cos 3x - 1 = 0$

$(2\cos 3x - 1)(\cos 3x + 1) = 0$

$\cos 3x = \frac{1}{2}, -1$

8. D $3x = \frac{\pi}{3}, \frac{5\pi}{3}, \frac{7\pi}{3}, \frac{11\pi}{3}, \ldots$

$3x = \pi, 3\pi, \ldots$

$x = \frac{\pi}{9}, \frac{5\pi}{9}, \frac{7\pi}{9}, \frac{11\pi}{9}, \frac{13\pi}{9}, \frac{17\pi}{9}, \frac{\pi}{3}, \pi, \frac{5\pi}{3} = 9\pi$

9. D -7 = $3 - 2q = 7$

$q = -2$

$\frac{3-2(-2)}{3+2(-2)} = -7$

$3x^4 - 8x^3 - 83x^2 + 148x - 60 = 0$

$(x-1)(x+5)(x-6)(3x-2) = 0$

10. C $x = 1, -5, 6, \frac{2}{3}$

$x^2 = 1, 25, 36, \frac{4}{9}, \sum x^2 = \frac{562}{9}$

11. D $\begin{bmatrix} 5 & 0 & 6 \\ 11 & -4 & 10 \\ 8 & 9 & 3 \end{bmatrix}$ Add entries in the same position.

12. B -5 = Add the values in the main diagonal.

13. A = 3.14159…..

14. E $\begin{pmatrix} i & j & k \\ 4 & 7 & -3 \\ -2 & -2 & -7 \end{pmatrix} = -55i + 34j + 6k$

15. B edge = 8 units, the corners will all have 3 faces painted. That leaves 6 cubes per edge.

(6)(12) = 72 cubes

16. B $16 = \dfrac{(x-2)^2 + (3y-4)^2 = 256}{\sqrt{256} = 16}$

17. D 10 = $n = 1 \ldots\ldots \dfrac{1}{2}\left(\dfrac{2!}{1!}\right) = 1$

$n = 2 \ldots\ldots \dfrac{1}{3}\left(\dfrac{4!}{2!2!}\right) = 2$

$n = 3 \ldots\ldots \dfrac{1}{4}\left(\dfrac{6!}{3!3!}\right) = 5$

18. D The terms that will not be are: $(2x)^{100}$ and $(3y)^{100}$

19. E $QuadII:$

$r = 4, \theta = \pi/3$

$(4, \frac{2\pi}{3}) or (-4, \frac{-\pi}{3})$

20. D $\sqrt{2}$ = $(y+2)^2 - (x+3)^2 = 16$

$\dfrac{(y+2)^2 - (x+3)^2 = 16}{16} = \dfrac{(y+2)^2}{16} - \dfrac{(x+3)^2}{16} = 1$

$a = 4, b = 4, c = 4\sqrt{2}$

$e = \dfrac{c}{a} = \dfrac{4\sqrt{2}}{4} = \sqrt{2}$

21. A Napier

22. A 18 Bill = 18, Mary = 13. 10 years ago, Mary was 3, and in three years, Bill will be 21. 7(3)=21

23. C "B" had the most votes. A=1, B=2, C=0, D=1, E=1.

24. A There is a fixed number of observations. In a geometric distribution, the trials continue until

a success is reached.

25. C (1)(340) x (2)(170) x (4)(85) x (5)(68) x (17)(20) x (34)(10) = 340^6

26. A $\left(\frac{5}{3}, -1\right)$ Intersection of the Medians is just the average of the points.

27. C $\frac{a}{b} = \frac{3}{4}$

28. C $\frac{\pi}{6}$ units to the right : Phase Shift = -c/b = $g(x) = 4\sin\left(2x - \frac{\pi}{3}\right) = \frac{-\frac{\pi}{3}}{2}$

29. D $\frac{2x^3 + 8x^2 - 22x - 60}{x^2 - 5x + 6} = 2x + 18 + \frac{56x - 108}{x^2 - 5x + 6}$

30. B
$x = 5 + 6t$
$y = -8 + 10t$
$t = \frac{x-5}{6}, y = -8 + 10\left(\frac{x-5}{6}\right)$
$5x - 3y = 49$