

PC-Exam-Topics.doc

1. Absolute Value of a Vector
2. Unit Vector
3. Dot Product
4. cis form of complex number
5. System of Equations
6. Partial Fraction Decomposition
7. Matrix Addition
8. Matrix Multiplication
9. Multiplication Dimension (Order) of Matrices
10. nth term of sequence arithmetic and geometric
11. Reduce factorial fraction
12. Geometric Sum
13. Geometric Partial Sum
14. Term of binomial expansion
15. Possible arrangements
16. Conics
17. Parametrics
18. Polar conversion
19. Dot Product
20. Solve triangle, given 3 parts
21. Unit Vector
22. Counting

1. $\vec{v} = \langle 3, -5 \rangle$ Find $\|\vec{v}\|$
2. Find the unit vector that has the same direction as $\vec{u} = 2\mathbf{i} - 5\mathbf{j}$.
3. Find the dot product of $\vec{v} \cdot \vec{u}$ from #'s 1 and 2.
4. Convert $6 + 2i$ to cis form.
5. Solve:
$$\begin{cases} 3x + 3y + 5z = 1 \\ 3x + 5y + 9z = 0 \\ 5x + 9y + 17z = 0 \end{cases}$$
6. Write the partial fraction decomposition for: $\frac{4x^2 - 15x - 1}{(x - 1)(x + 2)(x - 3)}$
7. $\begin{bmatrix} 3 & 1 & 11 \\ 4 & 3 & 23 \end{bmatrix} + \begin{bmatrix} 3 & 1 & 11 \\ -5 & 0 & -10 \end{bmatrix}$
8. $\begin{bmatrix} 3 & 2 & -4 \\ 2 & 5 & 8 \end{bmatrix} * \begin{bmatrix} 3 & x \\ x & 2 \\ 1 & -1 \end{bmatrix}$
10. Find the nth term: 29, 33, 37, 41, 45,
10. Find the nth term: $405 + 135 + 45 + 15 + \dots$
11. Simplify: $\frac{22! \cdot (n - 1)!}{20! \cdot (n + 1)!}$

More Review

- Solve:
$$\begin{cases} 5x + 2y - z = -7 \\ x - 2y + 2z = 0 \\ 4y + z = 17 \end{cases}$$
- In $\triangle ABC$, $b = 47$, $c = 29$, $A = 50^\circ$. Find the area to the nearest 100th.
- Write, using standard summation notation: $13 + 16 + 19 + \dots + 202$
- Write the Standard Form Equation given: 2 Vertices $(4, 9)$, $(4, -21)$; 2 Foci $(4, 3)$, $(4, -15)$.
- Express $1.232323\overline{23}$ as a reduced fraction of integers.
- Write the Standard Form Equation of a Parabola given: $F(6, 4)$; Dir: $y = -2$
- Convert $4 - 4\sqrt{3}i$ to polar form exactly. (NO Decimals)
- Use the interval $[0, 2\pi]$: $\sec(\arctan \frac{2}{3}) =$
- Find the work done by force $B = \langle -3, 9 \rangle$ that moves a mass from point $(-1, -3)$ to point $(-8, 6)$.
- Exactly Find $(10 \text{ cis } 7) \div (2 \text{ cis } 5)$
- Write the recursive form for: 2, 4, 10, 28, 82, 244, ...
- Solve for X:
$$\begin{bmatrix} 3 & 7 \\ 8 & 9 \end{bmatrix} X + \begin{bmatrix} 2 & 7 \\ 6 & 9 \end{bmatrix} = \begin{bmatrix} 3 & 6 \\ 9 & 6 \end{bmatrix}$$
- Write the partial fraction decomposition for: $\frac{3x^2 + 32x - 75}{x^3 + 2x^2 - 15x}$
- How many 6 card hands are possible with 3 from 1 suit and 3 from a different suit?
- Two cards are drawn from a standard deck of cards. In how many ways can both be black or both be face cards.
- $$\begin{bmatrix} 3 & 5 & 7 \\ 2 & -6 & 1 \end{bmatrix} * \begin{bmatrix} 5 & x \\ -8 & 7 \\ 2 & y \end{bmatrix} =$$
- Use the interval $[0, 2\pi]$: $\sin^{-1}(\sin \frac{\pi}{3}) =$
- Find the determinant of:
$$\begin{bmatrix} 1 & -2 & 5 \\ 2 & x & 1 \\ 3 & 4 & 6 \end{bmatrix}$$
- How many distinguishable ways can the letters of the word PROBABILITIES be arranged?
- In $\triangle ABC$, $a = 10$, $b = 12$, $c = 15$. Find the area to the nearest 100th.
- In $\triangle ABC$, $A = 36^\circ$, $B = 77^\circ$, $a = 521$. Find b to the nearest 100th.
- $125 + 50 + 20 + 8 + \dots =$
- $5 + 8 + 11 + \dots + 854 =$
- Write in simplified form, the 31st term of the expansion: $(x + y)^{40}$.

25. Find to 3 decimal places, the magnitude of vector $\langle 9, -4, 5 \rangle$.
26. In $\triangle ABC$, $c = 30$, $a = 60$, $C = 17^\circ$. Find A to the nearest 100th.
27. Given $\vec{u} = \langle -2, 4 \rangle$ and $\vec{v} = \langle 1, 11 \rangle$. Find $9\vec{u} - \vec{v}$.
28. Find the component form of \vec{u} where $\|\vec{u}\| = 10$ and \vec{u} has direction 45° above the negative x-axis.
29. Find the standard form of the complex number: $12\left(\cos \frac{13\pi}{6} + i \sin \frac{13\pi}{6}\right)$.
30. $A = \begin{bmatrix} 3 & 1 & 11 \\ 4 & 3 & 23 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 1 & 11 \\ -5 & 0 & -10 \end{bmatrix}$ Find $8A - 2B$.
31. Convert the polar equation $r = -4 \sin \theta + 9 \cos \theta$ to rectangular form.
32. A group of students, 8 girls and 3 boys, are to stand in a line. Find the probability that the 3 boys are next to each other.
33. $2x^2 + 16x + 2y^2 - 8y = 400$ is the equation of a circle. Find the Center and Radius
34. $x^2 - 22y = 0$. Find the Vertex and the Focus
35. $\sum_{n=1}^{219} (4n - 3) =$
36. Convert the point $\left(-5, \frac{-2\pi}{3}\right)$ from polar to rectangular coordinates.
37. Find the 3rd term for the expansion of $(2x - 3y)^9$
38. Convert to Polar: $x^2 + y^2 = 10x$
39. Convert to Rectangular: $r = 7 \sin \theta$
40. In how many ways can a group of 8 people, chosen from 20 be arranged in a circle?
41. Find the 7th term in the expansion of $(2x - 5y)^{11}$
42. \overrightarrow{Force} (5 lbs, 21°) moves an object from P(2, 3) to Q(5, 7). Find the Work done
43. Given the sequence $a_n = 5(-3)^n$, Write the recursive form of the sequence.
44. $\mathbf{u} = 3\mathbf{i} - 2\mathbf{j} + 10\mathbf{k}$ & $\mathbf{v} = 2\mathbf{i} - 5\mathbf{k}$. Find $\mathbf{u} \cdot \mathbf{v}$.
45. $\mathbf{m} = 4\mathbf{i} - 5\mathbf{j} + 6\mathbf{k}$. Find a unit vector with the same direction as \mathbf{m} .
46. Find the Partial Fraction Decomposition of $\frac{3x}{x^2 - 3x + 2}$