

"Daily E of Math" Calendar Solutions



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(Proved) Theorem Index: (for reference, theorems)

- Interior angles of x -sided n -gons: pg. 5
sum to $(n-2) \cdot 180^\circ$
- Sum of exterior angles of x -sided n -gon is 360°
- ϕ is multij formula: _____ pg. 15
- If $|G| = p^2$, $p \neq 2$ primes, then: _____ pg. 18
 $G \cong C_{p^2}$
- $|D_n| = 2n$: _____ pg. 22
- Wilson's Thm $((n-1)! \equiv -1 \pmod{n})$: pg. 23
 $\Leftrightarrow n$ prime
- Formula for $\binom{n}{k}$: _____ pg. 26
- Crystallographic Regularity: _____ pg. 29a
- $(\mathbb{Z}_{20}, \text{Nim } \oplus)$ is an Abelian group: pg. 33
- Equations involving $x, \sqrt{x}, x^2, \sum x^2$: pg. 37
- Lucas-Lehmer Mersenne Primes Test: pg. 38
- Matrix polar decomposition: _____ pg. 41
- Euclid-Euler Perfect #'s Thm: _____ pg. 44
- σ is mult: _____ pg. 44
- $(a+\sqrt{b})^n + (a-\sqrt{b})^n \in \mathbb{Z}$: _____ pg. 47
- An \mathbb{R} stable for $n \neq 1, 2, 4$: _____ pg. 58
(sort of sketchy)
- Max. # planar regions cut by n lines: _____ pg. 63
- Solve 2-term linear Diophantine EGS: pg. 67
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- Volume of simplices: _____ pg. 69
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- 2-generated numerical semigroups: _____ pg. 74
- Geometric series: _____ pg. 75
- Repeating base- b expansions: _____ pg. 76
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- Constant Coeffs Linear DE solutions: _____ pg. 93
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- Sum of Fibonacci #'s: _____ pg. 119
- Pick's Theorem: _____ pg. 123
- Euler-Fermat (sketch): _____ pg. 128

(Proved) Theorem Index (continued):

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• alt. sum of squares	pg. 169
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• Divisibility by 11	pg. 182

List of "Broken" Problems:

- Jan. 10 - not enough restrictions on A, B for uniqueness of solutions.
- May. 23 - incorrect boundary plane (needed $2\sqrt{3}$, not 2).
- May. 30 - need to specify two parallel lines
- June 11 - missing end parentheses
- July. 25 - needs "commutative".
- Aug. 28 - VIII was typed as VII.
- Sept. 4 - "are within distance 1 of each other".
- Nov. 7 - the continued fraction doesn't converge, at least as likely interpreted?
- Nov. 16 - no degree symbols.
- Dec. 5 - what's meant by "3-regular"? Really just looking for minimum degrees of arbitrary planar graphs.
- Dec. 10 - " ft/s ", not " ft/s^2 ".
- Dec. 14 - missing degree symbols.
- Dec. 17 - missing an integer constraint for uniqueness of solutions.
- Dec. 17 - really not sure what's up here? Numbers are very off...

Subject Index: (very rough) / multiple listings

1/2

Arithmetic: Jan: 3, 19. Feb: 8, 12, 21, 27. Mar: 5, 10, 15, 28. Apr: 30.
June: 5, 11, 17. Aug: 19. Sept: 21. Nov: 21, 27. Dec: 6, 23, 25.

Complex #s/Roots of Polys: Jan: 5. Feb: 1, 3, 4, 17. June: 9, 20, 22, 27. July: 5, 17, 28.
Aug: 17, 26. Sept: 2, 20, 23, 25. Oct: 21, 25, 26. Nov: 4, 17, 24, 26.
Dec: 3, 27.

Algebra: Jan: 1. Feb: 10, 20. Mar: 19, 23. June: 13. July: 4, 16, 19, 26. Aug: 16, 29.
Oct: 10. Nov: 11. Dec: 28.

Abstract Algebra: Feb: 7, 15, 28. Mar: 7, 17, 26. Apr: 2, 12. May: 1, 31. June: 10.
July: 14, 25. Aug: 21. Sept: 1. Oct: 19. Nov: 12, 14.

Calculus: Feb: 3, 9, 14. Mar: 2, 3, 21, 25. May: 9, 21, 23, 25. June: 7, 26, 30.
Aug: 10, 14, 18, 20, 23. Sept: 9, 14, 28. Oct: 11, 16, 22, 23.

Geometry: Jan: 2, 9, 12, 14, 15, 17, 18, 20, 25, 28. Feb: 13, 18, 24. Mar: 9, 20, 30. Apr: 4, 25, 27.
May: 4, 11, 15, 22, 24, 30. July: 11, 15, 24. Aug: 4, 6, 7, 9, 13, 27. Sept: 4, 7, 10, 15, 16, 30.
Oct: 5, 7, 8, 9, 20, 24. Nov: 9, 10, 15, 18, 25, 29. Dec: 12, 13, 14, 17, 29, 30.

Number Theory: Jan: 4, 8, 11, 27, 29, 30, 31. Feb: 2, 25. Mar: 1, 13, 22, 24, 29, 31. Apr: 1, 3, 5, 6, 8, 13, 17, 18, 19, 28, 29.
May: 3, 5, 12, 17, 18, 19, 20, 28. June: 3, 8, 14, 19, 23, 25. July: 13, 20, 21, 22.
Aug: 1, 3, 21, 25. Sept: 11, 12, 17, 19, 24, 27, 29. Oct: 4, 15, 18, 27, 28. Nov: 20, 23. Dec: 14, 7, 18, 21, 22, 24.

Combinatorics: Jan: 6, 21, 22. Feb: 6, 16. Mar: 8, 11, 16. Apr: 10, 11, 16, 20, 22, 23.
May: 10, 11, 20. June: 15, 16, 18. July: 8. Aug: 8, 12, 15, 31. Sept: 13, 16.
Oct: 7, 12. Nov: 1, 22. Dec: 21.

Subject Index continued:

Linear Algebra: Jan: 13, 27. Mar: 12. Apr: 26. May: 14, 27. June: 29. Sept: 17. Dec: 31.

Functions/etc: Jan: 7, 10, 16, 23, 26. Feb: 22, 26. Mar: 4, 6, 27. Apr: 7, 9, 15, 21.
May: 2, 6, 13, 29. July: 9, 29. Sept: 22. Oct: 13. Nov: 3, 6, 8, 13, 16.
Dec: 2, 15, 16, 26.

Graph Theory: Apr: 24. May: 26. July: 2, 3, 6, 7. Aug: 30. Sept: 3, 6. Oct: 2.
Dec: 5.

"Physics"/Word Problems: Jan: 24. Feb: 5. Mar: 14, 18. May: 7. June: 4, 24, 30. July: 12, 23, 31.
/"Real Life"/Non-Problems Aug: 11, 13, 28. Sept: 8. Oct: 1, 17. Nov: 28. Dec: 10, 28.

Probability: Feb: 11, 23. Apr: 14. May: 8, 16. June: 6, 21. Aug: 22. Sept: 26. Oct: 3.
Nov: 1, 2, 5. Dec: 8, 9, 11.

Analysis: June: 1, 2, 12. July: 1, 18, 27. Aug: 24. Sept: 5, 18. Nov: 7, 19, 30.
Dec: 4, 25.

Diff EQ's: June: 28. Oct: 14.

Set Theory + Foundations: Aug: 2, 5.