

ACROSS

1. Like some avengers
6. Like show horses' feet
10. Marines ranked just above Pvts.
14. Pain reliever brand
15. Source of protein for vegetarians
16. The E in QED
- *17. 2006 (Australian)
19. Constellation whose principal star is Vega
20. Signal used to find shipwrecks
21. Type of plane transformation
- *22. 1950 (French)
27. Gawk at
28. Align the crosshairs
29. Willy of "Free Willy"
30. "Skinny Legs _____": 1990 Tom Robbins novel
34. Common ending of chemical sugars
37. What the answers to all of the starred clues are
40. Birth mo. of Euler
41. Solvent formed when a hydroxyl group is protonated
42. Style of jazz singing
43. Auguste Chevalier, to Evariste Galois
44. Colt's mother
- *45. 1954 (French)
53. Ends of prayers
54. Widely used text: "Abstract Algebra" by Dummit & _____
55. Writer/director Ephron
- *56. 2010 (Vietnamese)
61. Gas or elec., e.g.
62. "Alas!"
63. Computer operators
64. Gets
65. Snake's sound
66. Sri _____

DOWN

1. Schroedinger's pet in a box
2. It comes in Pale and Brown varieties
3. Each
4. WALL-E's love
5. Adjective that describes the set \mathbb{Q} vis-a-vis the set \mathbb{R} , e.g.
6. Surgical tube
7. "It's _____ heck in here!"
8. Saint Joan _____
9. Twosome

10. Denzel Washington movie: "The Taking of _____ 123"
11. Appliance with an oil vat and basket
12. Unit of mass and gold purity
13. Premium cable channel
18. Not pro
21. Term for bad, watered down beer
22. Bath sponge
23. "Get _____!"
24. Stomach malady
25. Like some numbers
26. Islamic equivalent of kosher
30. Computer scheme for character-encoding
31. Weekly music magazine in the UK
32. This can be used to identify whether a system of eqns. has a soln.
33. Mathematician and pioneering computer scientist Lovelace, credited with writing the first ever computer program
34. Algebraic geometer Zariski, 1981 Wolf Prize winner
35. Drummer with Lennon and McCartney
36. Cosmetician Lauder
38. Reduces the amplitude of an oscillating system
39. "Woe _____!"
43. _____ of Mathematics: bimonthly journal published in Princeton
45. Two-faced Roman god who is an eponym for a month
46. Express dismay or elation, for instance
47. Eagle's home
48. Run of letters towards the beginning of the alphabet
49. You'll find infinitely many of these in the Hilbert Hotel
50. Judges' wear
51. Greek letter used to denote the Dirichlet function that is the alternating version of the series expression for the Riemann zeta function
52. Asian capital, and the location of the 2014 ceremony to recognize more 37-Across
56. Slangy "no"
57. Jefferson Davis was its Pres.
58. Rooster's partner
59. Noah built one in the Bible
60. Home country of eleven 37-Across, to date (abbr.)

A1046. Because $\int_a^b f(x) dx = 0$, it follows that

$$\int_a^b xf(x) dx = \int_a^b \left(x - \frac{a+b}{2}\right) f(x) dx.$$

By the Triangle Inequality for Integrals and the bound $|f(x)| \leq M$,

$$\begin{aligned} \left| \int_a^b xf(x) dx \right| &= \left| \int_a^b \left(x - \frac{a+b}{2}\right) f(x) dx \right| \\ &\leq \int_a^b \left|x - \frac{a+b}{2}\right| |f(x)| dx \leq M \int_a^b \left|x - \frac{a+b}{2}\right| dx \\ &= 2M \int_a^{(a+b)/2} \left(\frac{a+b}{2} - x\right) dx = \frac{M(b-a)^2}{4}. \end{aligned}$$

Solution to puzzle on page 360

C	A	P	E	D		S	H	O	D		P	F	C	S
A	L	E	V	E		T	O	F	U		E	R	A	T
T	E	R	E	N	C	E	T	A	O		L	Y	R	A
				S	O	N	A	R		S	H	E	A	R
L	A	U	R	E	N	T	S	C	H	W	A	R	T	Z
O	G	L	E						A	I	M			
O	R	C	A		A	N	D	A	L	L		O	S	E
F	I	E	L	D	S	M	E	D	A	L	I	S	T	S
A	P	R		A	C	E	T	A	L		S	C	A	T
			A	M	I						M	A	R	E
J	E	A	N	P	I	E	R	R	E	S	E	R	R	E
A	M	E	N	S		F	O	O	T	E				
N	O	R	A		N	G	O	B	A	O	C	H	A	U
U	T	I	L		A	H	M	E		U	S	E	R	S
S	E	E	S		H	I	S	S		L	A	N	K	A