

Chem 109A
Prof. Bode
Fall 2004, MWF 11-12

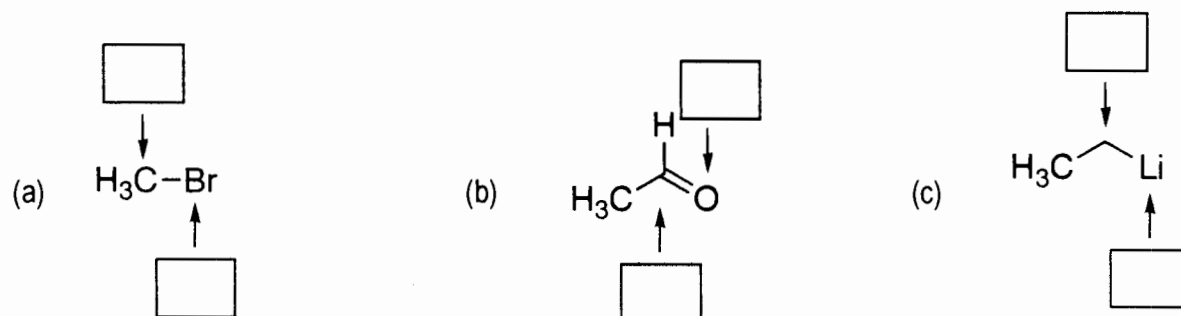
Name _____

Perm No. _____

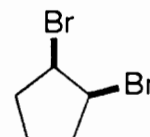
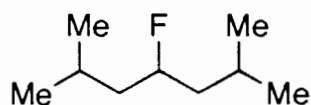
Mid-Term 1 (103 points)

| | Points | Possible Points |
|---------------|----------------------|------------------------|
| Page 1 | _____ | / 21 |
| Page 2 | _____ | / 28 |
| Page 3 | _____ | / 26 |
| Page 4 | _____ | / 18 |
| Page 5 | _____ | / 10 |
| Total | <input type="text"/> | / 103 |

1. Assign partial positive (δ^+) and negative (δ^-) charges to the indicated atoms based on bond polarization. (6 points)



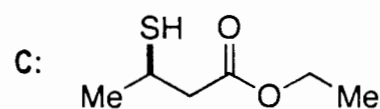
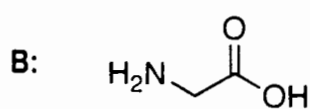
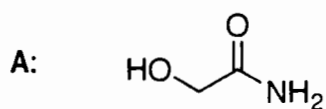
2. Name the following compounds: (6 points)



(a) _____

(b) _____

3. Name the functional groups found in each of the following molecules. (6 points)



(a) _____

(c) _____

(e) _____

(b) _____

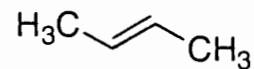
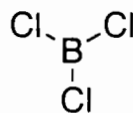
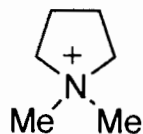
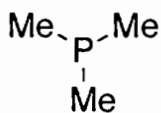
(d) _____

(f) _____

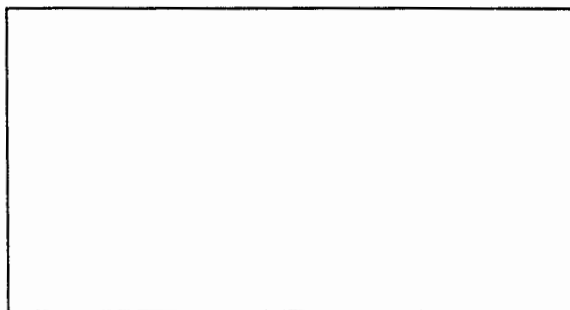
4. Rank the protic acid strength of the molecules shown in question 3, in order of strongest to weakest protic acid. (3 points)



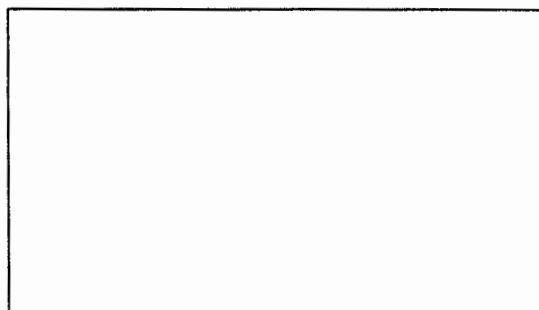
5. **Circle** molecules that are nucleophiles and draw a **square** around Lewis Acids. (4 points)



6. Draw Newman projections for the following conformers of 1,2-dichloroethane. (10 points)



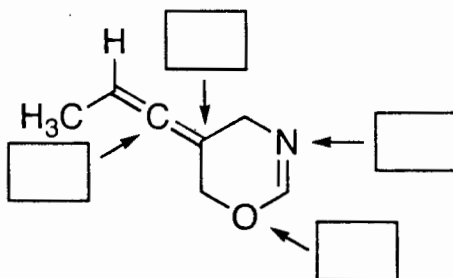
(a) most stable



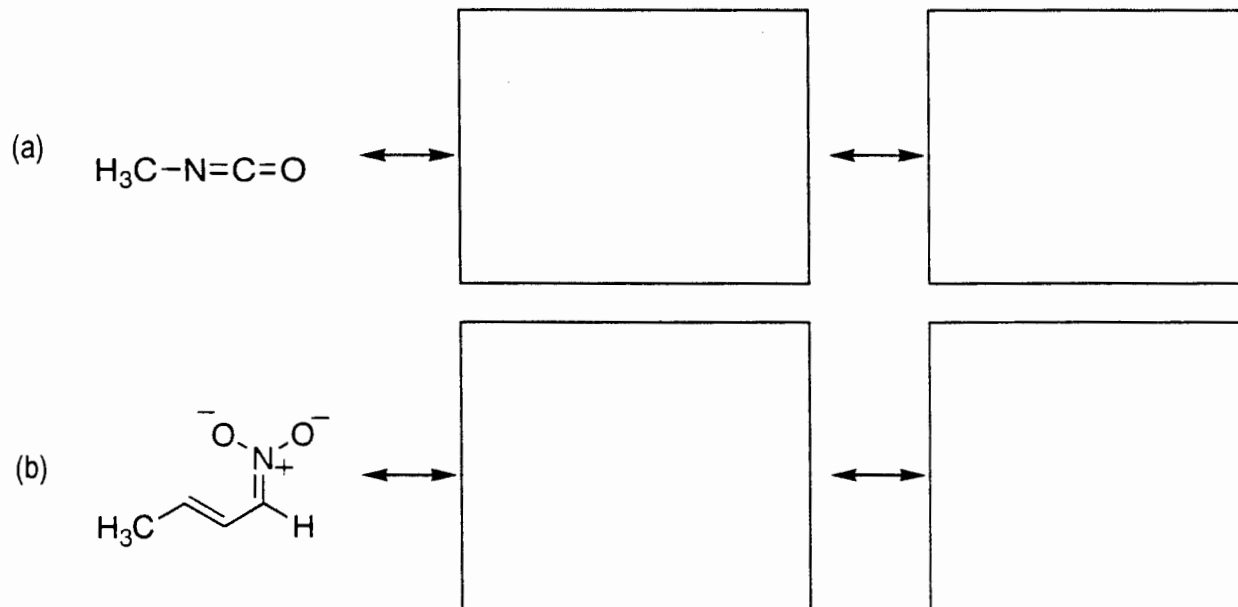
(b) least stable

7. Draw the structure of acetylene ($\text{HC}\equiv\text{CH}$). In your structure, draw and label all of the orbitals on each of the carbons and hydrogens. (Hint: What is the hybridization of the carbons?) (6 points)

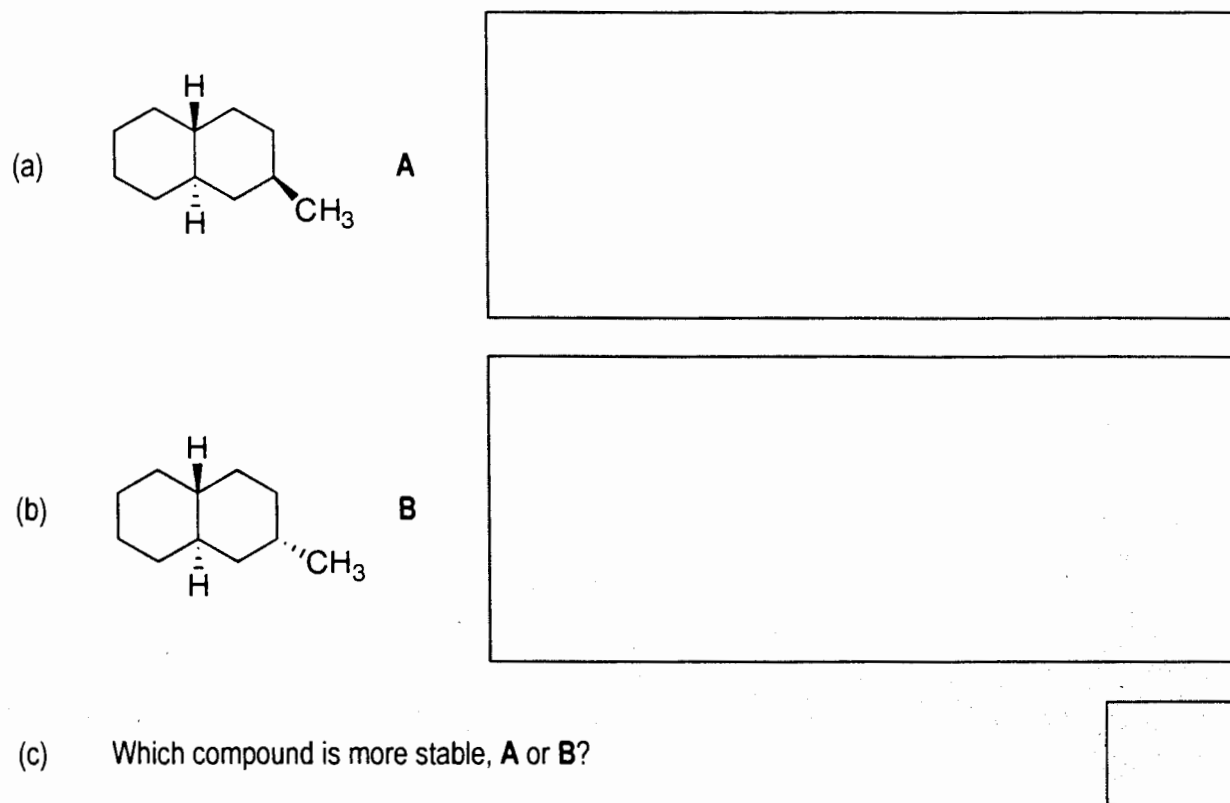
8. Identify the hybridization (sp , sp^3 , etc.) for each of the following atoms (8 points):



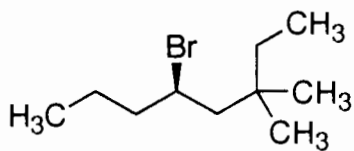
9. Draw two resonance structures for the following compound. (Remember: Keep track of the charges!)(12 points)



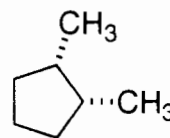
10. Draw the following decalins in their most stable chair conformations (14 points)



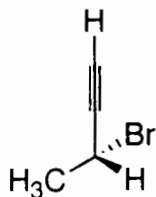
11. Identify the following compounds as (*R*), (*S*), meso, or achiral (8 points)



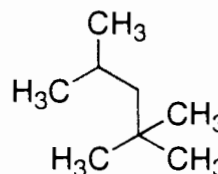
(a)



(b)



(c)



(d)

12. Label the relationship between each of the pairs of compounds as one of the following: (10 points)

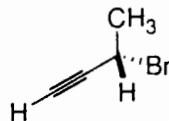
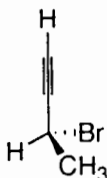
D: diastereomers

E: enantiomers

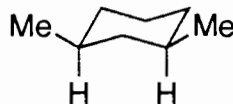
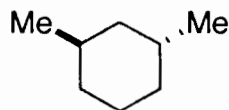
CI: constitutional isomers

S: same compound

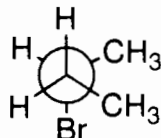
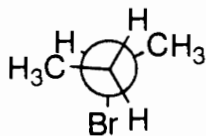
(a)



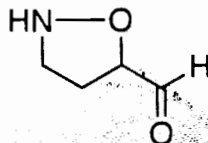
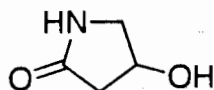
(b)



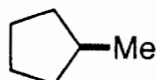
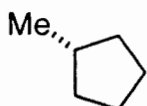
(c)



(d)



(e)



13. Planar cyclopentane would have C–C bond angles of 108° , but cyclopentane is **not** planar in its most stable conformation. (10 points)

(a) Draw, or described in words, the most stable conformation of cyclopentane.

(b) Explain, using Newman projections, why cyclopentane is not planar.

PERIODIC TABLE OF THE ELEMENTS

Map: [Download Pdf-split by Periodic Table](#)

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| 1 IA | | | | | | | | | | | | | | | | | | 2 IIA | | | | | | | | | | | | | | | | | | 3 IIIA | | | | | | | | | | | | | | | | | | 4 IVA | | | | | | | | | | | | | | | | | | 5 VA | | | | | | | | | | | | | | | | | | 6 VIA | | | | | | | | | | | | | | | | | | 7 VIIA | | | | | | | | | | | | | | | | | | 8 VIIIA | | | | | | | | | | | | | | | | | | 9 VIIIA | | | | | | | | | | | | | | | | | | 10 VIIIA | | | | | | | | | | | | | | | | | | 11 VIIIA | | | | | | | | | | | | | | | | | | 12 VIIIA | | | | | | | | | | | | | | | | | | 13 IIIB | | | | | | | | | | | | | | | | | | 14 IIIB | | | | | | | | | | | | | | | | | | 15 IIIB | | | | | | | | | | | | | | | | | | 16 IIIB | | | | | | | | | | | | | | | | | | 17 IIIB | | | | | | | | | | | | | | | | | | 18 VIIIA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 H | | | | | | | | | | | | | | | | | | 2 He | | | | | | | | | | | | | | | | | | 3 Li | | | | | | | | | | | | | | | | | | 4 Be | | | | | | | | | | | | | | | | | | 5 B | | | | | | | | | | | | | | | | | | 6 C | | | | | | | | | | | | | | | | | | 7 N | | | | | | | | | | | | | | | | | | 8 O | | | | | | | | | | | | | | | | | | 9 F | | | | | | | | | | | | | | | | | | 10 Ne | | | | | | | | | | | | | | | | | | 11 Na | | | | | | | | | | | | | | | | | | 12 Mg | | | | | | | | | | | | | | | | | | 13 Al | | | | | | | | | | | | | | | | | | 14 Si | | | | | | | | | | | | | | | | | | 15 P | | | | | | | | | | | | | | | | | | 16 S | | | | | | | | | | | | | | | | | | 17 Cl | | | | | | | | | | | | | | | | | | 18 Ar | | | | | | | | | | | | | | | | | | 19 K | | | | | | | | | | | | | | | | | | 20 Ca | | | | | | | | | | | | | | | | | | 21 Sc | | | | | | | | | | | | | | | | | | 22 Ti | | | | | | | | | | | | | | | | | | 23 V | | | | | | | | | | | | | | | | | | 24 Cr | | | | | | | | | | | | | | | | | | 25 Mn | | | | | | | | | | | | | | | | | | 26 Fe | | | | | | | | | | | | | | | | | | 27 Co | | | | | | | | | | | | | | | | | | 28 Ni | | | | | | | | | | | | | | | | | | 29 Cu | | | | | | | | | | | | | | | | | | 30 Zn | | | | | | | | | | | | | | | | | | 31 Ga | | | | | | | | | | | | | | | | | | 32 Ge | | | | | | | | | | | | | | | | | | 33 As | | | | | | | | | | | | | | | | | | 34 Se | | | | | | | | | | | | | | | | | | 35 Br | | | | | | | | | | | | | | | | | | 36 Kr | | | | | | | | | | | | | | | | | | 37 Rb | | | | | | | | | | | | | | | | | | 38 Sr | | | | | | | | | | | | | | | | | | 39 Y | | | | | | | | | | | | | | | | | | 40 Zr | | | | | | | | | | | | | | | | | | 41 Nb | | | | | | | | | | | | | | | | | | 42 Mo | | | | | | | | | | | | | | | | | | 43 Tc | | | | | | | | | | | | | | | | | | 44 Ru | | | | | | | | | | | | | | | | | | 45 Rh | | | | | | | | | | | | | | | | | | 46 Pd | | | | | | | | | | | | | | | | | | 47 Ag | | | | | | | | | | | | | | | | | | 48 Cd | | | | | | | | | | | | | | | | | | 49 In | | | | | | | | | | | | | | | | | | 50 Sn | | | | | | | | | | | | | | | | | | 51 Sb | | | | | | | | | | | | | | | | | | 52 Te | | | | | | | | | | | | | | | | | | 53 I | | | | | | | | | | | | | | | | | | 54 Xe | | | | | | | | | | | | | | | | | | 55 Cs | | | | | | | | | | | | | | | | | | 56 Ba | | | | | | | | | | | | | | | | | | 57 La | | | | | | | | | | | | | | | | | | 58 Ce | | | | | | | | | | | | | | | | | | 59 Pr | | | | | | | | | | | | | | | | | | 60 Nd | | | | | | | | | | | | | | | | | | 61 Pm | | | | | | | | | | | | | | | | | | 62 Sm | | | | | | | | | | | | | | | | | | 63 Eu | | | | | | | | | | | | | | | | | | 64 Gd | | | | | | | | | | | | | | | | | | 65 Tb | | | | | | | | | | | | | | | | | | 66 Dy | | | | | | | | | | | | | | | | | | 67 Ho | | | | | | | | | | | | | | | | | | 68 Er | | | | | | | | | | | | | | | | | | 69 Tm | | | | | | | | | | | | | | | | | | 70 Yb | | | | | | | | | | | | | | | | | | 71 Lu | | | | | | | | | | | | | | | | | | 72 Hf | | | | | | | | | | | | | | | | | | 73 Ta | | | | | | | | | | | | | | | | | | 74 W | | | | | | | | | | | | | | | | | | 75 Re | | | | | | | | | | | | | | | | | | 76 Os | | | | | | | | | | | | | | | | | | 77 Ir | | | | | | | | | | | | | | | | | | 78 Pt | | | | | | | | | | | | | | | | | | 79 Au | | | | | | | | | | | | | | | | | | 80 Hg | | | | | | | | | | | | | | | | | | 81 Tl | | | | | | | | | | | | | | | | | | 82 Pb | | | | | | | | | | | | | | | | | | 83 Bi | | | | | | | | | | | | | | | | | | 84 Po | | | | | | | | | | | | | | | | | | 85 At | | | | | | | | | | | | | | | | | | 86 Rn | | | | | | | | | | | | | | | | | | 87 Fr | | | | | | | | | | | | | | | | | | 88 Ra | | | | | | | | | | | | | | | | | | 89 Ac | | | | | | | | | | | | | | | | | | 90 Th | | | | | | | | | | | | | | | | | | 91 Pa | | | | | | | | | | | | | | | | | | 92 U | | | | | | | | | | | | | | | | | | 93 Np | | | | | | | | | | | | | | | | | | 94 Pu | | | | | | | | | | | | | | | | | | 95 Am | | | | | | | | | | | | | | | | | | 96 Cm | | | | | | | | | | | | | | | | | | 97 Bk | | | | | | | | | | | | | | | | | | 98 Cf | | | | | | | | | | | | | | | | | | 99 Es | | | | | | | | | | | | | | | | | | 100 Fm | | | | | | | | | | | | | | | | | | 101 Md | | | | | | | | | | | | | | | | | | 102 No | | | | | | | | | | | | | | | | | | 103 Lr | | | | | | | | | | | | | | | | | |
| 19 39.098 | | | | | | | | | | | | | | | | | | 20 40.078 | | | | | | | | | | | | | | | | | | 21 44.956 | | | | | | | | | | | | | | | | | | 22 47.867 | | | | | | | | | | | | | | | | | | 23 50.942 | | | | | | | | | | | | | | | | | | 24 51.996 | | | | | | | | | | | | | | | | | | 25 54.938 | | | | | | | | | | | | | | | | | | 26 55.845 | | | | | | | | | | | | | | | | | | 27 58.933 | | | | | | | | | | | | | | | | | | 28 58.933 | | | | | | | | | | | | | | | | | | 29 63.546 | | | | | | | | | | | | | | | | | | 30 65.38 | | | | | | | | | | | | | | | | | | 31 69.723 | | | | | | | | | | | | | | | | | | 32 72.64 | | | | | | | | | | | | | | | | | | 33 74.922 | | | | | | | | | | | | | | | | | | 34 78.96 | | | | | | | | | | | | | | | | | | 35 79.904 | | | | | | | | | | | | | | | | | | 36 83.80 | | | | | | | | | | | | | | | | | | 37 85.468 | | | | | | | | | | | | | | | | | | 38 87.62 | | | | | | | | | | | | | | | | | | 39 88.906 | | | | | | | | | | | | | | | | | | 40 91.224 | | | | | | | | | | | | | | | | | | 41 92.906 | | | | | | | | | | | | | | | | | | 42 95.94 | | | | | | | | | | | | | | | | | | 43 98 | | | | | | | | | | | | | | | | | | 44 101.07 | | | | | | | | | | | | | | | | | | 45 102.91 | | | | | | | | | | | | | | | | | | 46 105.42 | | | | | | | | | | | | | | | | | | 47 107.87 | | | | | | | | | | | | | | | | | | 48 112.41 | | | | | | | | | | | | | | | | | | 49 114.82 | | | | | | | | | | | | | | | | | | 50 118.71 | | | | | | | | | | | | | | | | | | 51 121.76 | | | | | | | | | | | | | | | | | | 52 127.60 | | | | | | | | | | | | | | | | | | 53 126.90 | | | | | | | | | | | | | | | | | | 54 131.29 | | | | | | | | | | | | | | | | | | 55 132.91 | | | | | | | | | | | | | | | | | | 56 137.33 | | | | | | | | | | | | | | | | | | 57 138.905 | | | | | | | | | | | | | | | | | | 58 140.908 | | | | | | | | | | | | | | | | | | 59 144.913 | | | | | | | | | | | | | | | | | | 60 148.917 | | | | | | | | | | | | | | | | | | 61 150.919 | | | | | | | | | | | | | | | | | | 62 151.96 | | | | | | | | | | | | | | | | | | 63 157.25 | | | | | | | | | | | | | | | | | | 64 158.925 | | | | | | | | | | | | | | | | | | 65 162.50 | | | | | | | | | | | | | | | | | | 66 164.93 | | | | | | | | | | | | | | | | | | 67 168.935 | | | | | | | | | | | | | | | | | | 68 173.04 | | | | | | | | | | | | | | | | | | 69 174.999 | | | | | | | | | | | | | | | | | | 70 178.04 | | | | | | | | | | | | | | | | | | 71 178.48 | | | | | | | | | | | | | | | | | | 72 180.948 | | | | | | | | | | | | | | | | | | 73 183.84 | | | | | | | | | | | | | | | | | | 74 186.21 | | | | | | | | | | | | | | | | | | 75 188.906 | | | | | | | | | | | | | | | | | | 76 190.23 | | | | | | | | | | | | | | | | | | 77 192.22 | | | | | | | | | | | | | | | | | | 78 195.08 | | | | | | | | | | | | | | | | | | 79 198.97 | | | | | | | | | | | | | | | | | | 80 200.59 | | | | | | | | | | | | | | | | | | 81 204.38 | | | | | | | | | | | | | | | | | | 82 207.2 | | | | | | | | | | | | | | | | | | 83 208.98 | | | | | | | | | | | | | | | | | | 84 209 | | | | | | | | | | | | | | | | | | 85 210 | | | | | | | | | | | | | | | | | | 86 222 | | | | | | | | | | | | | | | | | | 87 223 | | | | | | | | | | | | | | | | | | 88 226 | | | | | | | | | | | | | | | | | | 89 227 | | | | | | | | | | | | | | | | | | 90 232.04 | | | | | | | | | | | | | | | | | | 91 231.04 | | | | | | | | | | | | | | | | | | 92 238.03 | | | | | | | | | | | | | | | | | | 93 237 | | | | | | | | | | | | | | | | | | 94 244 | | | | | | | | | | | | | | | | | | 95 243 | | | | | | | | | | | | | | | | | | 96 247 | | | | | | | | | | | | | | | | | | 97 247 | | | | | | | | | | | | | | | | | | 98 251 | | | | | | | | | | | | | | | | | | 99 252 | | | | | | | | | | | | | | | | | | 100 257 | | | | | | | | | | | | | | | | | | 101 258 | | | | | | | | | | | | | | | | | | 102 259 | | | | | | | | | | | | | | | | | | 103 262 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Dated April 2011, 73 No. 4, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

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