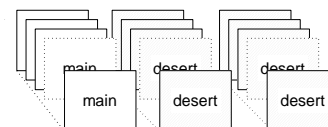


# Answer Key

1. 1,200
2. 80,000
3. 600
4. 14,000
5. 160,000
6. 16,000
7. .008
8. -.001
9. .006
10. .009
11. 10.92
12. -120
13.  $\frac{2}{3}$
14. 13.64
15. 11.96
16. 5.83
17. 675
18. 58
19. 0.072
20. 150
21. 5
22.  $0.86+1.49+1.19 = 3.54$   
 $\frac{1}{3}(3.54) = \$1.18$
23.  $3 \times 4 = 12$  (cost of 3 binders)  
 $20 - 12 = 8$  (cost of pencils)  
 $8 \div 4 = \$2.00$  (a pencil)
24.  $2 \times 2 = \$4.00$
25.  $4 \times 4 = 16$   
 $3 \times 2 = 6$   
 $6 + 16 = \$22.00$
26.  $12 \times 4.75 = 3 \times 19 = \$57$
27.  $420 \div \frac{2}{3} = 420 \times \frac{3}{2} = 210 \times 3 = \$630$
28.  $840 \div \frac{1}{2} = 840 \times 2 = \$1680$
29.  $24 \div \frac{3}{5} = 40$
30.  $15 \div \frac{5}{8} = 24$
31.  $30 \div 2\frac{1}{2} = \$12$
32.  $136 \div 2\frac{2}{3} = 136 \div \frac{8}{3} = 136 \times \frac{3}{8} = 17 \times 3 = 51$
33.  $\frac{1}{3} = .3333... = 33.33333...%$   
 $= 33\frac{1}{3}\%$

34.  $1\frac{1}{4} : 2\frac{1}{2} = 1 : 2$ , which means 1 cup of sugar needs 2 cups of flour. Therefore, 3 cups of sugar needs 6 cups of flour.
35.  $4 \times 20 \times 25 = \boxed{2000}$
36.  $250 \div 50 = 5$  hrs
37.  $35 \div 50 = 0.7 = 70\%$
38.  $7 \times 3 = 21$  (with change)  
 $7 \times 4 = 28$  (not enough)  
He can only buy 3 books at most.
39.  $3 \times 2 \times 2.5 = \$15$
40.  $15 \times \frac{3}{5} = 9$
41. 
$$\begin{array}{r} \frac{15}{40} \\ + \frac{40}{28} = \frac{43}{40} = 1\frac{3}{40} \\ \hline \frac{40}{40} \end{array}$$
42. 
$$\begin{array}{r} \frac{51}{84} \\ - \frac{35}{84} = \frac{16}{84} \\ \hline \frac{84}{84} \end{array}$$
43. 
$$\begin{array}{r} \frac{51}{90} \\ - \frac{44}{90} = \frac{7}{90} \\ \hline \frac{90}{90} \end{array}$$
44. 
$$\begin{array}{r} \frac{56}{120} \\ - \frac{25}{120} = \frac{31}{120} \\ \hline \frac{120}{120} \end{array}$$
45. 
$$\begin{array}{r} \frac{42}{150} \\ + \frac{55}{150} = \frac{97}{150} \\ \hline \frac{150}{150} \end{array}$$
46. 
$$\begin{array}{r} \frac{56}{144} \\ - \frac{45}{144} = \frac{11}{144} \\ \hline \frac{144}{144} \end{array}$$
47.  $\frac{1}{3}$
48. 7
49.  $\frac{2}{5}$
50.  $\frac{3}{20}$
51.  $\frac{2}{9}$
52.  $\frac{11}{5} \times \frac{10^2}{24^3} \times \frac{7}{22^2} = \frac{1}{3}$
53.  $\frac{49}{100} \times \frac{20}{35} \times \frac{25}{16} = \frac{7}{16}$
54.  $\frac{3}{5} \times \frac{1}{8} \times \frac{4}{3} = \frac{1}{10}$
55.  $\frac{3}{5} \times \frac{1}{8} \times \frac{8}{3} = \frac{1}{5}$
56.  $\frac{8}{5} \times \frac{25}{8} \times \frac{5}{3} = \frac{25}{3} = 8\frac{1}{3}$

57.  $\frac{10}{9} \times \frac{13}{6} \times \frac{27}{26} \times \frac{12}{5} = \frac{10^2 \times 13 \times 27^3 \times 12}{9 \times 6 \times 26 \times 5} = 6$
58.  $\frac{5}{2} \times \frac{4}{15} = \frac{2}{3}$
59.  $\frac{1}{2 - \frac{1}{3}} = \frac{1}{2 - \frac{2}{3}} = \frac{3}{4}$
60.  $\frac{5}{3} = 1\frac{2}{3}$
61.  $\frac{39-30}{30} = 0.3 = 30\%$
62.  $\frac{3}{8} \times 6 = \frac{3}{4} \times 3 = 2\frac{1}{4}$
63. In every 3 cards, there will be 1 card for main dish and 2 cards for desert. Since there are 72 cards, there are 24 cards for main dish and 48 cards for desert.

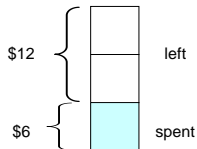


64.  $1:30 + 4:00 + 3:00 = 8:30$   
P.M.
65.  $9:00 - 4:00 + 3:00 = 8:00$   
P.M.
66.  $2 \times 10 = 20$  (ones)  
The carry to the tens is 2.  
 $2 \times 9 = 18$  (tens)  
 $18 + 2 = 20$   
The carry to the hundreds is 2.  
 $2 \times 8 = 16$  (hundreds)  
 $16 + 2 = 18$   
The hundreds digit is 8.
67.  $8 \times 2 = 17$ , there is 1 in carry from the 1000<sup>th</sup> digit.  
 $9 \times 2 = 18$ ,  $18 + 1 = 19$ , the result is 9.
68. Since the total number of shares is 4,  $180^\circ \div 4 = 45^\circ$ .  
Their measures are  $45^\circ$ ,  $45^\circ$ , and  $90^\circ$ .
69. C
70. E  
 $23 - 3 = 20$

## Dr. Li's GT5 After School Issue 15

- $20 - 3 \times 4 = 8$   
 $8 \div 4 = 2$  (4-leg tables)  
 $1 + 4 = \boxed{5}$  (3-leg tables)
71.  $BC^2 = BD^2 + CD^2$   
 $25^2 = 20^2 + 15^2$   
 $BD = 20$   
 $\frac{1}{2}(20)(30) = \boxed{300}$
72.  $3 + 6 = 9$   
 $9 \div 24 = \frac{3}{8} = \boxed{37.5\%}$
73.  $24 - 6 = 18$  hr
74. They are grandma, mom, and daughter.
75.  $240 \div 40 = 6$  hr
76.  $1 - 20\% = 0.8$   
 $90 \times 0.8 = 72$  mph
77.  $400 \times 75\% = 300$   
or  
 $300 \div 75\% = 300 \times \frac{4}{3} = 400$
78. D  
 $60 \times \frac{2}{5} = 24$
- $24 - 4 = 20$   
 $20 \div 2 = 10$
79.  $\frac{32}{40} = \frac{4}{5} = 0.8 = 80\%$
80.  $20\% = \frac{1}{5} = 1 : 5$   
boys : girls = 1 : 5  
boys =  $\frac{1}{6}$   
girls =  $\frac{5}{6}$   
 $\frac{5}{6}(30) = 25$  (girls)

# Answer Key

1. -20
  2. 9
  3. -15
  4. -3
  5. 16
  6. -7
  7. 1
  8. 19
  9. 8
  10. -2
  11. 7
  12. 2,500
  13. 56,000
  14. 0.00014
  15. 2
  16. 0.000042
  17. 30,000
  18. 0.0036
  19. 0.00001
  20. 0.0002
  21.  $5 \times 7 \times 5 \times 4$   
 $= 7 \times 100$   
 $= 700$  gal
  22.  $700 \times 4 = 2800$  gals
  23.  $12 \times 2 = 24$   
 $24 \div 3 = 8$  (Jon)  
 $8 \times 2 = 16$  (Tom)
  24.  $35 \times 6 = 210$   
 $210 \div 7 = 3$
  25. \$6  
 $12 \div 2 = 6$
  26. \$18  
 $6 \times 3 = 18$
- 
27. 3 ways :  $12 = 1 \times 12 = 2 \times 6 = 3 \times 4$
  28. 3 ways :  $18 = 1 \times 18 = 2 \times 9 = 3 \times 6$
  29. 5 ways :  $36 = 1 \times 36 = 2 \times 18 = 3 \times 12 = 4 \times 9 = 6 \times 6$
  30.  $60 \div 12 = 5$   
 $2(12 + 5) = 34$   
 $34 - 4 = 30$  tiles
  31.  $10.3 - 9.8 = 0.5$  second
  32.  $128 \div 8 = 16$  cups  
 $5 \times 16 = 80$  cups
  33. \$15.75
  34.  $320 \div 2 = 160$   
 $160 - 128 = 32$   
 $32 \div 160 = 20\%$
  35.  $96\frac{1}{10} - 77\frac{1}{5} = 19\frac{1}{10} - \frac{1}{5} = 18\frac{9}{10}$   
pounds
  36. 53 min
  37.  $200 + 300 + 100 = 600$   
 $600 \times 40\% = 600 \times 0.4 = 240$   
 $600 + 240 = \$840$
  38.  $3 \times 2 \times 4 = 24$
  39.  $\frac{150}{60} \times 80 = \frac{5}{2} \times 80 = 5 \times 40 = 200$  grams
  40. 7 hours and 24 minutes = 7.4 hr  
 $7.4 \times 15$   
 $= 105 + 6$   
 $= 111$   
 $111 \times 6 \times 2 = \$1,332$
  41.  $\frac{5}{12}$
  42.  $\frac{2}{7}$
  43.  $\frac{1}{18}$
  44. 4
  45. 6
  46. 100
  47.  $\frac{4}{7} \times \frac{7}{3} = \frac{4}{3} = 1\frac{1}{3}$
  48.  $\frac{32}{63}$
  49. 63.4
  50. 1.24
  51.  $\frac{3}{14}$
  52.  $4\frac{2}{3}$
  53.  $\frac{9}{5} \times \frac{27}{10} = \frac{9}{5} \times \frac{10}{27} = \frac{2}{3}$
  54.  $\frac{25}{7} \times \frac{14}{15} = \frac{10}{3} = 3\frac{1}{3}$
  55.  $(2 - \frac{4}{5}) \times (\frac{20}{81}) = \frac{6}{5} \times \frac{20}{81} = \frac{8}{27}$
  56.  $\frac{13}{39} - \frac{10}{9} = 1\frac{1}{9}$
  57.  $\frac{20}{49}$
  58.  $1\frac{3}{4} \times 5 \times 2 = \frac{35}{4} \times 2 = 17\frac{1}{2}$  hours
  59.  $2\frac{5}{6} \div 2 = 1\frac{5}{12}$
  60.  $\frac{2}{3} \times \frac{1}{4} = \frac{1}{6}$
  61.  $\frac{25}{10} \times 3 = 7.5$  lbs
  62. 75  
 $6 \times 43 = 258$   
 $8 \times 51 = 408$   
 $408 - 258 = 150$   
 $150 \div 2 = 75$
  63. C  
 $\frac{1}{6} - \frac{1}{12} = \frac{1}{12}$   
 $\frac{1}{12} \div 3 = \frac{1}{36}$   
 $\frac{1}{12} + \frac{1}{36} = \frac{4}{36} = \frac{1}{9}$
  64.  $\frac{6-4.8}{4.8} = \frac{1}{4} = 0.25 = 25\%$
  65.  $42.67 + 50 - 15 - 21 + 16.25 + 25 = \$97.92$
- |   |   |   |   |   |
|---|---|---|---|---|
|   | 4   | 3 | <span style="border: 1px solid black; padding: 2px;">1</span> | 2   |
|   |   | 4 | 5   | <span style="border: 1px solid black; padding: 2px;">4</span> |
| + | <span style="border: 1px solid black; padding: 2px;">4</span> | 1 | 2   | 7   |
|   | 8   | 8 | 9   | 3   |
- 66.
  67. a unit = 3  
length =  $3 \times 3 = 9$   
width =  $2 \times 3 = 6$   
 $9 \times 6 = 54$
  68.  $140 \div 20 = 7$
  69.  $25 \times 7 = 175$
  70.  $385 \div 7 = 55$  min
  71.  $120 \div 1600 = 0.075 = 7.5\%$
  72. B
  73. Since the average of B, C and D is 14, the total of the four boys is  
 $10 + 14 \times 3 = 52,$

## Dr. Li's GT5 After School Issue 16

thus the average of the four boys is

$$52 \div 4 = 13.$$

74. 3 meters

75.  $20 \times 8\% = 20 \times 0.08 = 2 \times 0.8 = \$1.60$

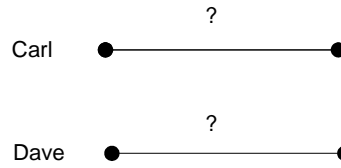
76.  $\frac{\text{discount}}{\text{price}} = \frac{10}{40} = \frac{1}{4} = 25\%$

77.  $15 - 3 = 12$

$12 \div 2 = \$6.00$  (Dave)

$6 + 3 = \$9.00$  (Carl)

Use the following diagram to solve.



78.  $\frac{800-600}{800} = \frac{1}{4} = 25\%$

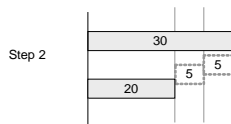
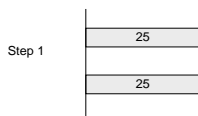
79.  $\frac{21}{4-2.5} \times (4+2.5) = \$91.00$

$\$3 \frac{21}{4-2.5}$  : the hourly rate  
 $4+2.5$  : total time

80.  $\frac{13}{25} = 0.52 = 52\%$   
**Total: \$15**

# Answer Key

1. 29
2. -10
3. 16
4. 27
5. -18
6. 5
7. 20
8. -4
9. 7
10. -3
11. 0.02
12. 0.00049
13. 24
14. 100
15. 280,000
16. 0.00012
17. 42,000
18. 80,000
19. 0.00012
20. 0.00018
21.  $\frac{1}{2}(7 + 9) = 8$
22.  $\frac{1}{2}(9 + 13) = 11$
23.  $10 \times 3 = 30$
24. 4, 5, 6
25.  $125 \times 4 = 500$  people
26.  $3 \times 50 - 2 \times 60 = 150 - 120 = 30$  lbs
27.  $14,000 \div 7 - 1800 = 200$  calories
28.  $7 \times 300,000,000 = 2.1$  billion trees
29.  $50 \div 2 = 25$  (average)  
 $10 \div 2 = 5$   
 $25 + 5 = 30$  (larger)  
 $25 - 5 = 20$  (smaller)



30.  $85 - 25 = 60$   
 $60 \div 2 = \$30$
31.  $\frac{1}{2}(80 + 90) = 85$
32.  $68 \times 3 = 204$   
 $204 - 56 - 78 = 70$
33. 109 yards
34. 144 yards
35.  $\frac{65 - 25}{2} = \$20$
36.  $184 \div 8 = 23$  miles per gallon
37.  $18 \div 2 = 9$
38.  $\frac{55 + 5}{2} = \$30$  (Alex)  
 $\frac{55 - 5}{2} = \$25$  (Brian)
39. 5, 7, and 9
40.  $\frac{1}{2}(62 + 78) = 70$
41.  $\frac{21}{24} - \frac{11}{24} = \frac{10}{24}$
42.  $\frac{22}{30} - \frac{43}{30} = -\frac{21}{30} = -\frac{7}{10}$
43.  $\frac{28}{60} - \frac{15}{60} = \frac{13}{60}$
44.  $\frac{42}{150} - \frac{55}{150} = -\frac{13}{150}$
45.  $\frac{28}{48} - \frac{13}{48} = \frac{15}{48} = \frac{5}{16}$
46.  $\frac{4}{16} + \frac{1}{16} = \frac{5}{16}$
47.  $\frac{9}{12} - \frac{7}{12} = \frac{2}{12} = \frac{1}{6}$
48.  $\frac{6}{8} - \frac{1}{8} = \frac{5}{8}$
49.  $\frac{9}{15} - \frac{5}{15} = \frac{4}{15}$
50.  $\frac{9}{24} + \frac{4}{24} = \frac{13}{24}$

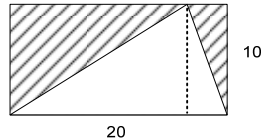
51.  $\frac{21}{30} + \frac{5}{30} = \frac{26}{30} = \frac{13}{15}$
52.  $\frac{1}{8} + \frac{4}{8} = \frac{5}{8} = 1 - \frac{3}{8}$
53.  $7 - \frac{5}{8} = 6 + \frac{5}{8}$
54.  $\frac{4}{12} + \frac{2}{12} = \frac{6}{12} = \frac{1}{2}$
55.  $6 + (\frac{1}{2} + \frac{2}{3} + \frac{1}{4}) = 6 + \frac{6+8+3}{12} = 6 + \frac{17}{12} = 7 \frac{5}{12}$
56.  $30 + 50\frac{3}{8} + 40\frac{1}{6} + 60\frac{1}{4} = 180 + (\frac{3}{8} + \frac{1}{6} + \frac{1}{4}) = 180 + \frac{9+4+6}{24} = 180\frac{19}{24}$
57.  $\frac{12}{16} - \frac{5}{16} = \frac{7}{16}$
58.  $3 - \frac{10}{12} = 2 \frac{2}{12} = 2 \frac{1}{6}$
59.  $\frac{21}{30} - \frac{5}{30} = \frac{16}{30} = \frac{8}{15}$
60. 8
61.  $60 \times 1\frac{1}{5} = \$72$
62.  $2.60 \div \frac{1}{3} = 7.80$   
 $7.8 \div \frac{3}{4} = \$10.40$
63.  $12.5 \times \frac{2}{5} = 5$  ft
64.  $\frac{2}{3}, \frac{3}{4},$  or  $\frac{5}{6},$  etc.
65.  $69 \times \frac{1}{3} = \$23$
66.  $13 \times (3.25 + 0.75) = \$52$
67.  $1 - \frac{3}{4} = \frac{1}{4}$   
 $12 \times \frac{1}{4} = 3$  yd
68.  $1 - \frac{2}{5} = \frac{3}{5}$   
 $10 \times \frac{3}{5} = 6$  mi
69.  $1 - \frac{2}{7} = \frac{5}{7}$   
 $28 \times \frac{5}{7} = \$20$
70.  $1 - \frac{3}{8} = \frac{5}{8}$   
 $32 \times \frac{5}{8} = 20$  square yards
71.  $\frac{45}{120} = \frac{3}{8}$
72.  $\frac{105}{120} = \frac{7}{8}$

## Dr. Li's GT5 After School Issue 18

73.  $\frac{3}{4} + \frac{1}{8} - \frac{1}{2} = \frac{3}{8}$  liter
74.  $4 \div \frac{2}{3} = 6$  commercials
75.  $32 = 2\frac{2}{3}$  dozen  
 $1.35 \times 2\frac{2}{3} = 2.7 + \frac{1}{3}(2.7) = 2.7 + 0.9 = \$3.60$
76.  $2\frac{2}{3} \times 60 = 120 + 40 = 160$  min
77.  $24 \times 2.75 = 24 \times 2\frac{3}{4} = 24 \times 2 + 6 \times 3 = 48 + 18 = \$66$
78.  $\frac{3}{4} \times 12 = 9$   
 $\frac{2}{3} \times 12 = 8$   
 $9 + 8 = 17$
79.  $6\frac{1}{3} + 2\frac{3}{4} = 9\frac{1}{12}$
80.  $30 \times \frac{3}{2} = 45$
81.  $20 \div (20+20) = \frac{1}{2} = 50\%$
82.  $40:15 = 8:3$
83.  $1 - \frac{1}{6} = \frac{5}{6}$   
 $\frac{5}{6} \times \frac{1}{7} = \frac{5}{42}$   
 $8.4 \times \frac{5}{42} = 0.2 \times 5 = 1$  lb
84. In a trip of 600 miles,  
 $(600 \div 200) \times 8.5 = 25.5$  gal  
 (a) (red car more efficient)  
 $(600 \div 120) \times 5.2 = 26$  gal  
 (white car more expensive)
- 26 - 25.5 =  
 (b) 0.5 gal saved by the red car
85.  $64 \times (\frac{1}{4})^2 = 64 \times (1/16) = 4$
86.  $88 \times \frac{1}{2} = 44$   
 $1 - 25\% = 1 - \frac{1}{4} = \frac{3}{4}$   
 $44 \times \frac{3}{4} = \$33.00$
87.  $37.5 \div 50 = 0.375 = 75\%$
88.  $3.6 \div 12 = \$0.30$  (12-can)  
 $2.40 \div 6 = \$0.40$  (6-can)  
 You save 10¢ per can if you buy the 12-can carton.
89.  $12 \div (1 + \frac{1}{2}) = 8$
90.  $12 \times (1 + \frac{1}{3}) = 16$

# Answer Key

1. 15
2. 27
3. 0
4. 8
5. 26
6. 18
7. 95
8. 35
9. 38
10. 0
11. 0.016
12. 10,000
13. 4.8
14. 1.8
15. 0.006
16. 100,000
17. 4
18. 4
19. 0.056
20. 28,000
21. 31
22.  $79 \div 8 = 9R7$   
(a)  $9 + 1 = 10$   
(b) 7 people on extra
23. 35 degrees warmer
24.  $1937 - 1492 = 445$
25.  $20 \times \frac{1}{2} = 10$
26. 2,300,000 feathers
27. Alice = 3  
Carol = 7  
Lewis = 13
28. 4 centuries, 40 decades
29. The LCM of 6 and 8 is 24.  
So it is at the 24<sup>th</sup> house.
30.  $21 + 3 = 24$  (Quin)  
 $\frac{1}{3} \times 24 = 8$  (Rachel)
31. 84 games  
Use the following table.
 

Lost	2	24
Won	5	60
Total	7	84
32. 301, 298
33. 2 hours 19 min
34.  $2 \times 0.75 = 1.5$   
 $4 \times 0.75 = 3$   
 $6 \times 0.75 = 4.50$   
 $7 \times 0.75 = 5.25$   
At most 6 cans
35. Eric: 10  
Frank: 12  
Gerald: 15
36.  $400 \times 0.85 = \underline{\$340}$
37.  $1 \div 4 = 0.25$  (Store A)  
 $1.20 \div 5 = 0.24$  (Store B, cheaper)
38.  $120 \div 25 = 4R20$   
 $4 + 1 = \underline{5 \text{ boxes}}$
39. 234
40. Julio = 15  
Erin = 30  
Kesha = 37  
Total = 82
41.  $7\frac{7}{12}$
42.  $\frac{11}{12}$
43.  $1\frac{2}{7}$
44.  $6\frac{4}{9}$
45.  $1\frac{8}{11}$
46.  $\frac{4}{5}$
47.  $1\frac{4}{9}$
48.  $1\frac{3}{7}$
49. 90
50.  $\frac{7}{5} = 1\frac{2}{5}$
51.  $\frac{1}{15}$
52. 3
53.  $\frac{1}{15}$
54. 4
55. 6
56. 10
57.  $\frac{3}{100}$
58.  $\frac{21}{40}$
59.  $\frac{21}{50}$
60.  $\frac{4}{9}$
61.  $1\frac{3}{4}$
62.  $3 \times 12 = 36$
63.  $2\frac{3}{4}$
64.  $9 \div 4 = 2\frac{1}{4}$  ft = 2 ft 3 in
65.  $(144 \div 4) \div 12 = 3$  (ft each side)  
 $3^2 = 9$  (ft<sup>2</sup>)
66.  $13\frac{1}{2} \times 12 \div 13\frac{1}{2} = 12$
67.  $(10+15) \times 2 = 50$  in
68.  $\frac{1}{2}(\text{base} + \text{top}) \times \text{height} =$   
 $\frac{1}{2}(8+12) \times 20 = 200$
69. For the shaded rectangle, the length is  
 $10 + 4 - 6 = 8$   
The width is  
 $8 - 2 - 2 = 4$   
 $8 \times 4 = 32$  m<sup>2</sup>
70.  $\frac{1}{2} \times 20 \times 10 = 100$ 

71. 1-by-1's:  $4 \times 4 = 16$   
2-by-2's:  $3 \times 3 = 9$   
3-by-3's:  $2 \times 2 = 4$   
4-by-4's:  $1 \times 1 = 1$   
 $16 + 9 + 4 + 1 = \underline{30 \text{ squares}}$
72. For A:  $12 \div 20 = 0.6$   
For B:  $18 \div 30 = 0.6$   
both have the same steepness.
73.  $24 \div 4 = 6$   
 $2 \div 2 = 1$   
 $6 + 1 = 7$  (length)  
 $6 - 1 = 5$  (width)  
 $5 \times 7 = \underline{35 \text{ square yards}}$
74.  $P = 12\pi$   
 $A = 24\pi$
75.  $800 \div (20 \times 10) = 4$  in
76.  $176 \div 2 = 88$   
 $88 - 60 = 28$   
 $60 \times 28 = 1680$  ft
77.  $P = 12\pi$   
 $A = 12\pi$
78. Area  $\triangle BEF = \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{8}$   
 $= 12.5\%$   
So, the percentage of shaded region is 87.5%.

## Dr. Li's GT5 After School Issue 19

79.  $\frac{2}{5} = 0.4 = \underline{40\%}$

86. 3

80.  $0.4^2 = 0.16 = \underline{16\%}$

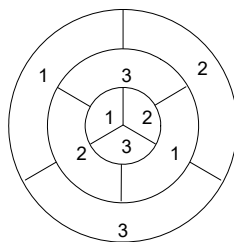
81.  $\frac{60-48}{60} = 0.2 = 20\%$

82.  $\frac{240}{15} = 16$  gal

83.  $240 \times \frac{3}{15} = \$48$

84.  $\frac{240}{50} = 4.8$  hr = 4 hr 48 min

85.  $16 - x^2$



87.  $290 \div 50 = 5.8$  hours = 5 hr and 48 min

88.  $16 \times 9 = 144$  (rectangle area)  
 $\frac{1}{2} \times 2 \times 2 = 2$  (triangle area)

$2 \times 4 = 8$

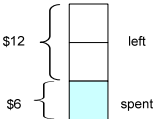
$144 - 8 = 136$  cm<sup>2</sup> (shaded region)

89.  $1200/500 = 2.4$  hours = 2 hr and 24 min

90.  $3.5 \times 16 = 4$  ft 8 in



# Answer Key

1. 35
2. 33
3. 17
4. 33
5. 9
6. 9
7. 26.5
8. 7.5
9. 24
10. 90
11. 0.000048
12. 0.000008
13. 0.00003
14. 0.00006
15. 180,000
16. 0.08
17. 180
18. 49
19. 4.9
20. 320,000
21.  $3 \times 4 = 12$  (cost of 3 binders)  
 $20 - 12 = 8$  (cost of pencils)  
 $8 \div 4 = \$2$  (a pencil)
22.  $2 \times 2 = \$4$
23.  $4 \times 4 = 16$   
 $3 \times 2 = 6$   
 $6 + 16 = \$22$
24.  $3 \times (80 \div 40) = \$6$
25.  $3 \times (100 \div 40) = \$7.50$
26. 10-  
 $(5 \times 0.69 + 3 \times 0.29 + 1.88 \times 1) =$   
 $\$3.80$
27.  $1.5 \times 16 = 24$   
 $24 \div 2 = \underline{12}$
28.  $\frac{1}{3} \times 21 + 3 = \underline{\$10}$
29.  $\frac{1}{2} \times 1200 \times 2 + \frac{1}{4} \times 1200 \times 3 =$   
 $1200 + 900$   
 $= \underline{2100}$
30. No  
 $1\frac{1}{2} + \frac{1}{2} + 1\frac{3}{4} = 3\frac{3}{4}$  hr  
 $6:00 + 3:45 = 9:45$
31.  $\frac{20}{120} = \frac{1}{6}$
32.  $\frac{30}{120} = \frac{1}{4}$
33.  $\frac{5}{8} \times 12 = 7.5$  million
34.  $12 \times \frac{1}{3} = 4$   
 $12 + 4 = \underline{\$16}$
35.  $20 \times \frac{1}{4} = 5$   
 $20 - 5 = \$15$
36.  $(4\frac{1}{4} + 5 + 6\frac{5}{8}) - (5 + 2\frac{1}{3} + 8\frac{1}{4})$   
 $= (\frac{1}{4} + \frac{5}{8}) - (\frac{1}{3} + \frac{1}{4})$   
 $= \frac{7}{24}$  hr
37.  $\frac{1}{5}(4\frac{1}{4} + 2\frac{1}{2} + 5 + 4\frac{3}{4} + 3\frac{1}{2})$   
 $= \frac{1}{5}(20)$   
 $= 4$
38. 8 hours and 45 minutes  
 $3\frac{1}{2} + 5\frac{1}{4}$   
 $= 8\frac{3}{4}$  hours  
 $= 8$  hours and 45 minutes.  
 $(\frac{1}{4}$  hour = 15 minutes).
39. 10 sec =  $\frac{1}{3}$  of 30 sec.  
 $\frac{1}{3}(600,000) = \$200,000$
40.  $6 \times 3 = \underline{18}$   

41. 4
42.  $\frac{21}{2}$
43. 90
44.  $\frac{7}{5} = 1\frac{2}{5}$
45. 14
46. 18
47.  $\frac{1}{15}$
48.  $\frac{3}{4}$
49.  $\frac{1}{6}$
50.  $\frac{1}{6}$
51.  $\frac{2}{9}$
52. 10
53.  $\frac{3}{100}$
54.  $\frac{21}{40}$
55.  $\frac{110}{7} = 15\frac{5}{7}$
56.  $\frac{2}{9}$
57.  $3\frac{3}{9} = 2\frac{5}{9}$
58.  $\frac{11}{12}$
59.  $7\frac{5}{6}$
60.  $15\frac{1}{6}$
61.  $24 \div 2 = \underline{12}$ , or  
 $3 \times 24 = 72, 72 \div 6 = \underline{12}$
62. Neither
63.  $13 - 7 = 6$
64. 500
65. 19
66.  $27 \div 7 = 3R6$   
 $3 + 1 = \underline{4}$  canoes
67.  $5:40$  pm -  $8:30$  am =  $17:40 -$   
 $8:30 = 9:10 = 9$  hours 10  
min  
 $9 + 1 = 10$  (hrs)  
 $10 \times 2 = \underline{\$20}$
68.  $\text{int}(\frac{30}{4}) + 1 = 8$
69. 3 ways :  $12 = 1 \times 12 = 2 \times 6 =$   
 $3 \times 4$
70. 3 ways :  $18 = 1 \times 18 = 2 \times 9 =$   
 $3 \times 6$
71. 5 ways :  $36 = 1 \times 36 = 2 \times 18 =$   
 $3 \times 12 = 4 \times 9 = 6 \times 6$
72. 12 are divisible by 1, 2, 3, 4,  
6, 12  
Only 3, 4, and 6 are desired.  
3 different options
73. 53, 59, 61, 67
74.  $\text{int}(\frac{1000}{2 \times 3 \times 5}) = \underline{33}$
75.  $11^2 = 121, 12^2 = 144, \dots, 14^2$   
 $= 196$   
4 of them
76.  $14 \times 15 = 7 \times 30 = \underline{210}$  cards
77.  $\text{round\_up}(\frac{420}{12} \times \frac{1}{2}) = \underline{18}$   
packets
78.  $\text{round\_down}(\frac{26.25}{2.5}) = 10$
79. LCM(2, 3, 4) = 12  
Monday + 12 = Saturday

80. The number of the next day is 1 more than twice that of the previous day. Twice of 1 is 2,  $2 + 1 = 3$ . Twice of 3 is 6,  $6 + 1 = 7$ . Thus,

- 1<sup>st</sup> day: 1,  
 2<sup>nd</sup> day:  $3 (2 \times 1 + 1)$ ,  
 3<sup>rd</sup> day:  $7 (2 \times 3 + 1)$ ,  
 4<sup>th</sup> day:  $15 (2 \times 7 + 1)$ ,  
 5<sup>th</sup> day:  $31 (2 \times 15 + 1)$ ,  
 6<sup>th</sup> day:  $63 (2 \times 31 + 1)$ ,  
 7<sup>th</sup> day:  $127 (2 \times 63 + 1)$ ,  
 8<sup>th</sup> day:  $255 (2 \times 127 + 1)$

81. (a) 10 (b) 100 (c) 1

82. (a) Just think of buying 5 for \$4.50.

$$(20 \div 5) \times 4.5 = \boxed{\$18.00}$$

(b)  $27 \div 4.5 \times 5 = \boxed{30 \text{ plants}}$

83.  $5 + 7 = 12$

$$3 - 1 = 2$$

$$1 \div 2 = \frac{1}{2}$$

$$12 \times \frac{1}{2} = 6$$

$$6 - 4 = 2 \text{ whites}$$

Double-check:

$$12 + 6 = 18$$

$$\frac{6}{18} = \frac{1}{3}$$

$$84. -20 \times -30 \times -40 \times -50 \times \frac{1}{2} \times \frac{1}{3} \times \frac{1}{4} \times \frac{1}{5} = 10,000$$

(Note: You should use cancellation instead of brutal multiplication.)

$$85. 10 + 15 = 25 \text{ (students)}$$

$$4 \times 25 + 10 = \boxed{110 \text{ books}}$$

$$86. 2178 \div 9 = \$242$$

$$87. 12 \times 5 = 60$$

$$8 \times 6 = 48$$

$$60 - 48 = 12$$

$$12 \div 4 = 3$$

$$88. 39 \times 3 = 117$$

$$117 - 9 = 108$$

89. (1)

$$\begin{array}{r} \text{A} \text{ B} \text{ C} \text{ D} \\ \text{A} \text{ B} \text{ C} \\ \text{A} \text{ B} \\ + \text{A} \\ \hline 1 \ 9 \ 8 \ 9 \end{array} \quad \text{A} = 1$$

$$(2) \begin{array}{r} \text{B} \text{ C} \text{ D} \\ \text{B} \text{ C} \\ + \text{B} \\ \hline 8 \ 7 \ 8 \end{array} \quad \text{B} = 7$$

$$(3) \begin{array}{r} \text{C} \text{ D} \\ \text{C} \\ + \\ \hline 1 \ 0 \ 1 \end{array} \quad \begin{array}{l} \text{C} = 9 \\ \text{D} = 2 \end{array}$$

Ans = 1792

$$90. 6 \times 5 \times 4 = 120 \text{ outcomes}$$

# Answer Key

1. 27
2. 94.5
3. 29.5
4. 92
5. 290
6. 21.5
7. 22.5
8. 12
9. 12
10. 33
11. 1,200
12. 300,000
13. 0.0032
14. 20,000
15. 0.0004
16. 0.032
17. 50,000
18. 0.02
19. 2,400
20. 0.18
21.  $\frac{1}{6} \times 31.20 = \$5.20$
22.  $12 - 3\frac{3}{4} - 2\frac{1}{2} = 7 - \frac{3}{4} - \frac{1}{2} = 6 - \frac{1}{4} = 5\frac{3}{4}$  (cases)
23.  $\frac{1}{2} + \frac{3}{4} = 1\frac{1}{4}$  yd
24.  $5 - 2\frac{2}{3} = 2\frac{1}{3}$  credits
25.  $1\frac{3}{4} + 2\frac{1}{6} = 3\frac{11}{12}$  mi
26.  $\frac{6}{54} = \frac{1}{9}$
27.  $5\frac{1}{3} - 2\frac{2}{3} = 2\frac{2}{3}$
28.  $25\frac{3}{4} + 6\frac{3}{8} = 32\frac{1}{8}$
29.  $24\frac{1}{2} - 12\frac{5}{8} = 11\frac{7}{8}$  pounds
30.  $32 \times \frac{3}{4} = 24$
31.  $7\frac{1}{2} + 15\frac{3}{4} = 23\frac{1}{4}$  inches
32.  $15.7 + 7\frac{1}{2} + 10\frac{1}{5} = 15.7 + 7.5 + 10.2 = 33.4$
33.  $2\frac{1}{2} + 3\frac{2}{3} = 6\frac{1}{6}$  credits
34.  $\frac{12800}{40} = 320$
35.  $38\frac{3}{4} - 31\frac{1}{4} = 7\frac{3}{4} - \frac{1}{4} = 7\frac{1}{2}$  pounds
36.  $\frac{4}{5}$
37.  $1\frac{1}{2} \times 6 = 9$  hours
38.  $\frac{6}{24} = \frac{1}{4}$
39.  $1\frac{1}{4} - \frac{1}{2} = \frac{3}{4}$
40.  $32\frac{1}{8} - 27\frac{3}{4} = 5\frac{1}{8} - \frac{3}{4} = 4\frac{3}{8}$  lb
41.  $\frac{2}{3}$
42.  $\frac{8}{33}$
43.  $\frac{1}{3}$
44.  $\frac{2}{9}$
45.  $\frac{8}{3} - \frac{1}{5} = 2\frac{2}{3} - \frac{1}{5} = 2\frac{10}{15} - \frac{3}{15} = 2\frac{7}{15}$
46.  $3 \times \frac{1}{4} \times 60 = 45$  min.
47.  $\frac{1}{20}$
48.  $\frac{1}{4}$
49. 10
50. 15
51. 30
52. 66
53.  $\frac{9}{20}$
54.  $\frac{12}{35}$
55.  $\frac{77}{120}$
56.  $\frac{22^{11}}{15^5} \times \frac{24^7}{8^4} = \frac{77}{20} = 3\frac{17}{20}$
57.  $\frac{28}{25}$
58.  $\frac{4}{5} \times \frac{7}{8} \times \frac{2}{3} = \frac{7}{15}$
59.  $\frac{4}{5} \times \frac{6}{5} \times \frac{5}{7} = \frac{24}{35}$
60.  $\frac{1}{2}$
61.  $4 \times 2.2 + 7.5 = 16.3$   
 $0.8 \times 16.3 = \$13.04$
62.  $\frac{120-96}{120} = \frac{24}{96} = \frac{1}{4} = 25\%$
63.  $\frac{45-40}{40} = \frac{1}{8} = 12.5\%$
64.  $\frac{1.5 \text{ million}}{30 \text{ million}} = \frac{1.5}{30} = 0.05$   
 $1 - 0.05 = 95\%$
65.  $12.5\% = \frac{1}{8}$   
 $192 \times \frac{1}{8} = 192 + 24 = \$216$
66.  $\frac{1}{3} = .3333... = 33.33333...%$   
 $= 33\frac{1}{3}\%$
67.  $12 \times 3 \times 1.05 = 36 \times 1.05 = \$37.80$
68.  $320 \div 2 = 160$   
 $160 - 128 = 32$   
 $32 \div 160 = 20\%$
69.  $\frac{170}{800} = 0.2125 = 21.25\%$
70.  $400 \times (1 - 65\%) = 420 \times 0.35 = \$147$
71.  $35.25 \times 40 = 352.5 \times 4 = \$1410$
72. D  
 $1410 \times 2 = 2820$   
 $3000 - 2820 = 180$   
 $35.25 \times 6 = 211.50 > 180$
73.  $36\% = 12\% \times 3$   
 $180 \times 3 = 540$  (people)
74.  $4\% = \frac{1}{3} \times 12\%$   
 $180 \times \frac{1}{3} = 60$  (people)
75.  $1\% = 12\% \div 12$   
 $180 \div 12 = 15$  (people)
76.  $15 \times 100 = 1500$  (people)
77.  $30 \times 80\% = 30 \times 8 = \$24$
78.  $40 \times 85\% = \$34$
79.  $10 + 25 + 15 = 50$   
 $\frac{35}{50} = 0.7 = 70\%$
80.  $23 + 22 = 45$  grams  
 $45 \div 5 = 9$  grams
81.  $160 \times 4 \times 3 = \$1920$
82. Considering the number of 1's used in the sum.
 

6×1's:	1+1+1+1+1+1
5×1's:	None
4×1's:	1+1+1+1+2
3×1's:	1+1+1+3
2×1's:	1+1+2+2 and 1+1+4
1×1:	1+2+3 and 1+5
0×1's:	2+2+2, 2+4 and 3+3

A total of **10** different ways.

83. 6 doors remaining open

1 <sup>st</sup>	1	2	3	4	5	6	7	8	9	0	1	2
2 <sup>nd</sup>	1	2	3	4	5	6	7	8	9	0	1	2
3 <sup>rd</sup>	1	2	3	4	5	6	7	8	9	0	1	2

The door is closed if its

## Dr. Li's GT5 After School Issue 21

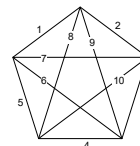
- number is boldfaced. The doors remain open is 1, 5, 6, 7, 11, and 12.
84. 3
85. The order does not matter in this problem. So, there are 10 outcomes:  
AB, AC, AD, AE,  
BC, BD, BE,
- CD, CE, and  
DE.
86. C  
 $4 \times 2 \times 1 = 8$
87. A  
 $4 \times (1 + 2 + 1 + 2) = 24$   
 $2 \times 1 \times 2 = 4$   
 $24 + 4 = 28$
88.  $84 \times \frac{6}{6+8} = 84 \times \frac{3}{7} = 36$
89.  $10 \times 8 = 80$   
 $6 \times 80 = 480$   
 $1440 \div 480 = 3$  days
90. The speed of the car is  $90 \div 3 = 30$  miles per hour. So, it can make 150 miles in 5 hours. To reach a town, 240 miles away, it needs 8 hours.

# Answer Key

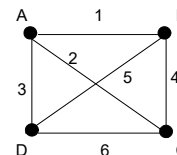
1. 101
2. 14
3. 29
4. 47
5. 14
6. 31
7. 26
8. 94
9. 575
10. 6
11. 240,000
12. 10
13. 0.00032
14. 0.0028
15. 240
16. 21,000
17. 0.012
18. 0.0056
19. 0.0035
20. 1.6
21.  $2 \times (12.5 + 6.5) = 38$  ft
22.  $3.75 \times 840 = \$3,150$
23.  $P = 160$  ft.
24.  $A = 1500$  sq. ft.
25. 20 sections
26.  $2 \times 5 \times (8 + 14) = 220$  (ft<sup>2</sup>)
27.  $220 \div 50 = 4R20$   
 $4 + 1 = 5$  gal
28.  $5 \times 12 = \$60$
29.  $2 \times (15 + 10) = 50$  in
30.  $15 \times 10 = 150$  sq. in.
31.  $192 \div 12 = 16$  in
32.  $20 \times 12 = 240$   
 $\frac{3}{4} \times 240 = 180$  in<sup>2</sup>
33.  $\frac{1}{2} \times 5 \times (3 + 7) = 25$
34.  $3$  in  $= \frac{1}{4}$  ft  
 $4 \times 5\frac{1}{3} = 21$  ft
35.  $80 \div 10 = 8$
36.  $50 \div 2 = 25$  (half-perimeter)  
 $25 - 10 = 15$  (length)

- $15 \times 10$   
 $= 150$  square inches
37.  $192 \div 12 = 16$
38. The length is 20 since  
 $56 \div 2 = 28$   
 $28 - 8 = 20$
39.  $36 = 6 \times 6$   
 $4 \times 6 = \underline{24}$  ft
40.  $60 \div 4 = 15$   
 $15^2 = \underline{225}$  in<sup>2</sup>
41.  $\frac{1}{12}$
42.  $\frac{1}{4}$
43.  $\frac{24}{35}$
44.  $\frac{4}{7}$
45.  $\frac{8}{7} = 1\frac{1}{7}$
46.  $\frac{3}{4}$
47. 20
48.  $\frac{10}{3} \times 9 \times \frac{1}{40} = \frac{3}{4}$
49. 9
50.  $\frac{8}{45}$
51. 2
52. 5
53. 4
54. 4
55. 6
56. 4
57. 6
58. 20
59. 20
60. 4
61.  $\frac{1}{2}(4 \times 3) = 6$  possible  
outcomes: AB, AC, AD, BC,  
BD, and CD
62. AB, AC, and AD.
63.  $3 \times 4 \times 2 = 24$
64. The order does not matter in  
this problem. There are 10  
outcomes:  
AB, AC, AD, AE,  
BC, BD, BE,  
CD, CE, DE.

65. 10 lines

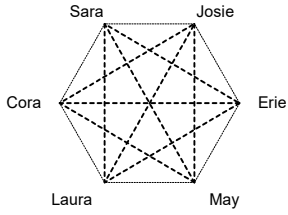


66. There are 10 different ways  
of displaying:  
AK, AL, AO, AS,  
KL, KO, KS,  
LO, LS,  
SO.  
Note that AK and KA are  
the same since the order  
does not matter.
67. 1H, 1T, 2H, 2T, 3H, 3T, 4H,  
4T, 5H, 5T, 6H, and 6T.  
 $6 \times 2 = \underline{12}$  outcomes
68. (1, 2), (1,3), (1, 4), (2, 3), (2,  
4), and (3, 4).  
 $\frac{1}{2}(4 \times 3) = \underline{6}$  outcomes
69. 1) 6 N  
2) 3 D  
3) 4 N 1 D  
4) 2 N 2 D  
5) 1 N 1 Q
70. 6 matches  
Assume they are A, B, C, and  
D. There are 6 matches as  
below:  
AB, AC, AD, BC, BD, and  
CD.
71. 6 segments



72. 10 segments
73. 15 matches
74. 15 skits  
Count the number of  
segments in the following  
diagram.

## Dr. Li's GT5 After School Issue 22



75. WB, WG, WR, BG, BR, GR.  
and  
BW, GW, RW, GB, RB, RG.  
12 outcomes
76. WW, BB, GG, R  
16 outcomes
77. (a)  
 $54 \div 3 = 18$  per hour (3-hour,  
better)  
 $60 \div 4 = 15$  per hour (4-hour)  
(b)  $18 - 15 = \$3$  an hour

78.  $36 + 24 = 60$   
 $720 \div 60 = 12$  pairs  
 $12 \times 2 = 24$  (cars)
79.  $720 \div 2 = 360$   
 $360 \div 36 = 10$   
 $360 \div 24 = 15$   
 $10 + 15 = 25$  (cars)
80.  $370 - 121 - 239 + 20 = 30$

81.  $60^\circ$
82. Equilateral triangle
83.  $120 + 240 = 360$  miles
84.  $= \frac{\text{Total distance}}{\text{Total time}}$   
 $= \frac{360}{5}$   
 $= 72$  miles per hour

86.  $650 - 50 = 600$   
 $600 \div 5 = \$120.00$
87.  $\frac{3}{4} \times (-12)^2 = \frac{3}{4} \times 144 = 108$
88. Method I) (Labor free)  
 $24.95 - 18.95 = 6$   
 $6 \times 22 = 132$   
 $132 - 18.95 = \boxed{\$113.05}$   
Method II) (Labor needed)  
 $24.95 \times 22 - 18.95 \times 23 =$   
 $113.05$
89.  $10^2 = 100$   
 $10 \times 4 = 40$   
 $\sqrt{9} = 3$   
 $40 \times 3 = \boxed{120 \text{ inches}}$
90.  $\frac{4}{3.2} \times 16 = 20$  (oz)

85.

	Math	English	PE	20. Biology (18 min)
Bernie	x		✓	x
Terry	x (iii)		x (iii)	✓
Ethel	✓		x (i)	x
Maureen	x (ii)	✓	x (i)	x (ii)