

Answer Key

1. $20 \times 3 - 12 - 15 = \boxed{33}$
 2.
$$\begin{array}{r} 4 + 1\frac{5}{8} = 1\frac{5}{8} \\ - 4 + \frac{1}{3} = -\frac{1}{3} \\ \hline \end{array} = 1\frac{7}{24} = 1\frac{7}{24}$$
 3. 64
 4. 5:10 A.M. - 9:40 P.M.
= 5:10 - 9:40 + 12:00 (next day)
= 17:10 - 9:40
= 7:30
= 7 hr & 30 min
 5. $\frac{3}{7} = \frac{9}{21} = \frac{12}{28}$
 $9 + 28 = \boxed{37}$
 6. 93
 7. $\frac{5}{8} = 5/8$
 8. $72000 \div 6 + 600 \div 2 + 900 \div 20$
= $12000 + 300 + 45$
= $\boxed{12345}$
 9. $36 \div 4 = 9$
 $9 \div 3 = 3$ in (each side of a square)
 $3 \times 3 \times 5 = \boxed{45 \text{ in}^2}$
 10. D
 $20 + \frac{1}{2}(40) = 30$
-
11. $100 \div 0.8 = 125$
 $125 - 100 = \boxed{\$25}$
 12. 9
 13. $13 - 5 = 8$ (length)
 $8 - 2 - 2 = 4$ (width)
 $8 \times 4 = 32 \text{ m}^2$ (area)
 14. 150
 15. $30\frac{3}{4} - 12\frac{5}{8} = 18\frac{1}{8} = 18\frac{1}{8}$ pounds
 16. Let x be the number of students.
 $3x + 5 = 4x - 21$
 $x = 26$
 17. $60 \div 4 = 15$
 $15 \times 3 = \boxed{45}$
 18. $14:15 - 8:55 = 5:20$
 $(5 \text{ hr } 20 \text{ min}) \div 4 = \boxed{1 \text{ hr } \& 20 \text{ min}}$
 19. $90 + 73 + 80 = 243$
 $243 \div 3 = \boxed{81}$
 20. $85 \times 4 = 340$
 $340 - 243 = \boxed{97}$
 21. $16/81$
 22. 1
 23. 0.09
 24. $\frac{2}{3} = 2/3$
 25. .005
 26. 3000
 27. 9
 28. 8
 29. 6
 30. $x = 4$
 31. $\frac{1}{4} = 1/4$
 32. 2
 33. $4^5 \div 2^7 = 2^{10} \div 2^7 = 2^3$
 $\square = 3$
 34. 3
 35. The area = $\frac{1}{2} \times 12 \times 16$
= $96 = \frac{1}{2} \times h \times 20$
 $h = 9.6 \text{ cm}$
 36. A
 37. H(-6, -6)
 38. $24 \times 60 = 1440 \text{ min}$
 $1440 \times 7 = 10080 \text{ min}$
 39. $600 \times 0.6 = \$360$
 40. $2,400,000 \div 3,000,000 = \0.80
 41. 16
 42. 50
 43. 15
 44. 6
 45. 8
 46. 10
 47. 45
 48. 20
 49. 16
 50. 6
 51. $x = -1$
 52. $x = -2$
 53. $x = 2$
 54. $x = 3$
 55. $x = 2$
 56. $x = 4$

MAP 270 (T3) Issue 1

57. $2(2x + 3) = 12$
 $4x + 6 = 12$
 $4x = 6$
 $2x = 3$
 $x = \frac{3}{2} = 3/2$
58. 0.4
59. 0.625
60. $-\frac{2}{3}$
61. 0.5
62. 0.25
63. 0.2
64. 0.125
65. 0.1
66. 10
67. 5
68. 5
69. 4
70. 4
71. 2
72. 2
73. 0.8
74. 8
75. 0.4
76. 0.08
77. 0.04

78. 0.02
79. 0.25
80. 0.0625
81. $\frac{16}{81} = 16/81$
82. -125
83. -16
84. $0.02 \times 16\% = 0.32\%$
85. 12
86. $18^2 = 324$
 $20^2 = 400$
 $22^2 = 484$
 $24^2 = 576$
Ans = 4 perfect squares
87. $5(x - 2) = 4(x + 6)$
 $5x - 10 = 4x + 24$
 $x = 34$
88. Multiply both sides by 28
 $12y + 14 = 7y$
 $5y = -14$
 $y = -14/5 = -2.8$
89. $0.4 \times 15 = 6$
 $6 + 10 = 16$
 $\frac{16}{25} = 64\%$
90. $12 \div 5 = 2.4 \text{ hr} = 2 \text{ hr \& 24 min}$
Note that $0.4 \text{ hr} = 0.4 \times 60 = 24 \text{ min}$)

Answer Key

1. $3 \times 18 - 25 = \boxed{29}$

2. $\frac{7}{24} = 7/24$

3. 2

4. 1 hr & 30 min

5. $\frac{9}{14} = 9/14$

6. 240000

7. 70

8. 240

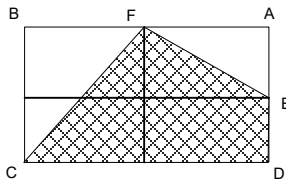
9. $3200 \div 5\frac{1}{3} = \boxed{600 \text{ mph}}$

10. C

The area of the shaded region is 15 square inches, which

$\frac{1}{2} + \frac{1}{8} = \frac{5}{8}$ of the area of ABCD.

So, the area(ABCD) = 24 square inches.



11. $11.50 - 2 \times 3.50 = 4.50$

$4.50 \div 3 = \boxed{\$1.50}$

12. $20 \times 20 \times 2 - 10 \times 10$

$= 800 - 100$

$= \boxed{700 \text{ in}^2}$

13. $800 = 2 \times 400$

$400 = 20 \times 20$

radius = 20

$2 \times 20 = 40 \text{ cm (diameter)}$

14. $1\frac{3}{4} \times 4 \times 3 = 21 \text{ hours}$

15. $\frac{1}{4} \times 10 = 2.5$

$2.5 + 2.25 = 4.75$

$10 - 4.75 = \boxed{5.25}$

16. 5

$114 \div 2 = 57$

$285 \div 57 = \boxed{5}$

17. $5 - 4 = 1$

$1 \div 4 = \frac{1}{4}$

$60 \times \frac{1}{4} = \boxed{15}$

18. $300 - 60 = 240$

$240 \div 5 = \boxed{\$48.00}$

2	24	64
2	12	32
2	6	16
	3	8

19. $2 \times 2 \times 2 = \boxed{8}$

20. There are 4 girls and 3 boys. From Alan's eyes, there are 2 boys, so the girls are twice the number of the boys. From Betty's eyes, there 3 girls, so there are the same number of girls and boys. $3 + 4 = \boxed{7}$

21. $\frac{3}{4} \times 144 = 108$

22. 1.44

23. 0.2

24. $\frac{24}{35} = 24/35$

25. .49

26. $1\frac{3}{7}$

27. $\frac{8}{3} \times \frac{15}{4} = 10$

28. 2

29. $\frac{1}{3}(n - \frac{2}{3}) = -2$

$n - \frac{2}{3} = -6$

$n = -5\frac{1}{3} = -5\frac{1}{3}$

30. $5(x + 3) = 30$

$x + 3 = 6$

$x = 3$

31. $\frac{1}{4} = 1/4$

32. $7 + 2 = 9$

$9 + 6 = 15$

$15 + 2 = 17$

$17 + 6 = 23$

$23 + 2 = 25$

33. $5 - 3\frac{4}{5} = 1\frac{1}{5} = 1\frac{1}{5}$

34. $9^4 \times 3^3 = 3^{11}$

$\square = 11$

35. 90°

36. C

37. I(3, -4.5)

38. 12

39. 30 ft

40. $2 \times (1.5 + 2.7) = 8.4$

41. 6

42. 63

43. 120

44. 165

MAP 270 (T3) Issue 2

45. 20
46. -4
47. 17
48. 0
49. -2
50. 6
51. $\frac{7}{3}$
52. -4
53. $x = -3$
54. $x = \frac{16}{3}$
55. $x = -1$
56. $x = -5$
57. $x = 2$
58. $x = 3$
59. $x = -2$
60. $x = -4$
61. -0.5
62. -0.125
63. 100
64. 0.04
65. 0.01
66. 25
67. 25
68. 16
69. 16
70. 4
71. 0.64
72. 64
73. 0.16
74. 0.0064
75. 0.0016
76. 0.0004
77. 5
78. 10
79. $\frac{1}{2}$
80. $\frac{1}{5}$
81. 125
82. 6
83. 16
84. $(20 \times 0.35)^2 = 7^2 = 49$
85. 50
86. 122.5
87. Multiply both sides by 20:
 $.2(x - 1) - \frac{1}{4}x = 1$
 $4(x - 1) - 5x = 20$
 $-x = 24$
 $x = -24$
88. Multiply both sides by 6, we have
 $3(x - 1) + 2(x + 1) = 6$
 $3x - 3 + 2x + 2 = 6$
 $5x = 7$
 $x = 1.4$
89. $1 - \frac{1}{8} - \frac{1}{4} - \frac{1}{3} = \frac{7}{24} = 7/24$
90. $4 \times 4 \times 4 = 64$ pieces
 $64 \times \frac{1}{4} = 16$ ft

Answer Key

1. 15
2. $100 - 98 + 66 - 64 + 2 = 6$
3. 5
4. $\frac{13}{15} = 13/15$
5. $10\frac{5}{24} = 10\ 5/24$
6. 286
7. 25
8. $12 = 4 \times 3$
 $15 = 5 \times 3$
The least common multiple is $3 \times 4 \times 5 = \boxed{60}$
9. $1 - 75\% = 25\%$
 $200 \times 25\% = \boxed{50 \text{ acres}}$
10. $20 \times \frac{1}{5} = 4$
 $20 + 4 = \boxed{\$24}$
11. 6:15 P.M. - 6:30 A.M.
 $= 18:15 - 6:30$
 $= \boxed{11\frac{3}{4} = 11\ 3/4 \text{ hr}}$
12. $330 \div 40 = 8R10$
 $\boxed{\text{Ans} = 9}$ boxes
13. D
1 square yard = 9 sq. ft.
14. 80
15. There are two methods to find the radius.
Method I)
 $60 \div 2 = 30$
 $30 = 10 + 20$
radius = 10
AB = 20
Method II)
 $2(1 + 2) = 6$
 $60 \div 6 = 10$ (radius)

 $10^2\pi = 100\pi = 314$
 $2 \times 314 = \boxed{628 \text{ cm}^2}$
16. \$95
17. $3 \times 0.8 + 2 \times 0.95 + 2.5$
 $= 2.4 + 1.9 + 2.5$
 $= 6.8$
 $10 - 6.8 = \$3.20$
18. $64 = 8 \times 8$
 $4 \times 8 = \boxed{32 \text{ in}}$
19. 12 (cups)
20. $3.50 - 0.25 = \boxed{3.25}$
21. $(\frac{1}{2})^2 - (\frac{1}{3})^3 = \frac{1}{4} - \frac{1}{27} = \frac{23}{108} = 23/108$
22. $1\ 9/16$
23. 0.9
24. $28/25$
25. 12.5
26. $1\frac{2}{3} \times 60 = 100 \text{ min}$
27. 3
28. -2
29. $t = 6$
30. 9
31. $\frac{1}{2} = 1/2$
32. $91 = 7 \times 13$
Ans = 7 & 13
33. $5 \times 12 = 60$
 $\frac{1}{3} \times 12 = 4$
 $60 + 4 = 64$
34. $80 \times 70\% = 80 \times .7 = \56
35. $5 \times 12 \div 6 = 10$ pieces of tile
 $6 \times 12 \div 6 = 12$
 $10 \times 12 = 120$ pieces
36. Let's split 12 into 3 parts: 2 for the tens digit, and 1 for the ones digit. So, tens digit is 8 and ones digit is 4.
Ans = 84
37. F(6, 4)
38. -1.25
39. $\frac{1}{2}x - \frac{1}{3}x = 6$
 $\frac{1}{6}x = 6$
 $x = 36$
40. $180 \div 250 = 72\%$
41. 72
42. -5
43. 80
44. -18
45. 42
46. 4
47. -12
48. 33
49. 2
50. 20
51. $x = 2$
52. $4(t + 5) = 3(t - 6)$
 $4t + 20 = 3t - 18$
 $t = -38$
53. $x = -2$
54. $x = 2$

MAP 270 (T3) Issue 3

55. $x = 1$
56. $t = 10$
57. $x = -2$
58. $x = -7$
59. $-0.5x - 4 = 5 - 1.5x$
 $\Rightarrow 2x = 9$
 $\Rightarrow x = 4.5$
60. $x = 2$
 $0.5x = 1$
 $x = 2$
61. -5
62. -5
63. -4
64. -4
65. -2
66. -2
67. -0.8
68. -8
69. -0.4
70. -0.08
71. -0.04
72. -0.02
73. 0.25
74. 0.0625
75. 0.04
76. 0.01
77. 100
78. 25
79. 25
80. 16
81. $-\frac{1}{8} = -1/8$
82. 5
83. -32
84. $\frac{11}{5} \div \frac{11}{2} = \frac{11}{5} \times \frac{2}{11} = \frac{2}{5} = 2/5$
85. 6
86. 314
87. $\frac{1}{2}x + \frac{2}{3}x = 14$
 $6(\frac{1}{2}x + \frac{2}{3}x) = 6 \times 14$
 $3x + 4x = 84$
 $7x = 84$
 $x = 12$
88. Multiply both sides by 12:
 $4(2x+3) = 3(x+6)$
 $4x+12 = 3x+18$
 $x = 6$
89. $12.8 \times \frac{375}{1000} = 4.8 \text{ lb}$
90. 123.45

Answer Key

1. .000006
 2. 100
 3. -5
 4. 60
 5. 60
 6. $\frac{2}{3} \times 24 = 16$
 7. 16
 8. $\text{GCD}(90, 72) = \boxed{18 \text{ teams}}$
 9. $90 \div 18 = \boxed{5 \text{ boys}}$
 10. $72 \div 18 = \boxed{4 \text{ girls}}$
 11. A
 12. If he open 3 boxes, then $3 \times 6 = 18$ (copies), which are not enough.
Ans = $\boxed{4 \text{ boxes}}$
 13. $\text{GCF}(45, 60, 90) = 15$ (groups)
 $45 \div 15 = 3$
 $60 \div 15 = 4$
 $90 \div 15 = 6$
 $3 + 4 + 6 = \boxed{13}$
 14. $30 \times 2 + 5 \times 2 + 4(15 - 5)$
 $= 60 + 10 + 40$
 $= \boxed{110}$
 15. C
radius = 10
 $\frac{3}{4} \times 2 \times 100\pi = 150\pi$
 $10 \times 20 = 200$
 $200 + 150\pi = 671$
- The diagram shows two overlapping circles, labeled A and B, positioned above a shaded rectangular region. The rectangle has a width of 20 and a height of 10. The circles are tangent to each other and to the top and bottom edges of the rectangle. The points of tangency on the bottom edge are labeled D and C.
16. Julio = 15
Erin = 30
Kesha = 37
Total = $\boxed{82}$
 17. $9.45 \div 3 = \$3.15$
 18. $\frac{1}{2} \times 3 \times 4 = 6$ (triangle area)
 $42 - 6 = 36$ (rectangle area)
 $36 \div 3 = 12$ cm (length of CD)
 $4 + 5 + 12 + 3 + 12 = \boxed{36 \text{ cm (perimeter)}}$
 19. $9,500 + 2,100 = \boxed{11,600}$
 20. $360 \div 10 = 36$
 $36 = 6 \times 6$
 $6 \times 6 \times 6 = 216$
 $2 \times 216 = \boxed{432 \text{ in}^3}$
 21. $\frac{1}{8} = 1/8$
 22. 1
 23. $\frac{9}{14} = 9/14$
 24. $\frac{5}{3} \div 1\frac{2}{3} = 1$
 25. 0.0009
 26. $4\frac{1}{3} = 4\frac{1}{3}$
 27. $12\frac{5}{6} = 12\frac{5}{6}$
 28. 214
 29. 9.5
 30. $4\frac{1}{4} - 3\frac{1}{3} = 1\frac{1}{4} - \frac{1}{3} = \frac{15-4}{12} = \frac{11}{12} = 11/12$
 31. $\frac{\frac{5}{18}}{\frac{2}{17}} = 17/18$
 32. $x^5 = \sqrt{x^{10}}, a = 10$
 33. -71
 34. $3.60 \div 12 = 0.3$
 $2.40 \div 6 = 0.4$
 $0.4 - 0.3 = \$0.10$
 35. $\text{GCF}(84, 96) = 12$
 $84 \div 12 \times (96 \div 12) = 7 \times 8 = 56$ pieces
 36. A
 $900 \div 300 \times 20 = 60$ (gallons)
 37. B
 $600 \div 60 = 10$
 38. G(-6, 6)
 39. 1440
 40. $30 \times 0.7 = 21$
 41. 42
 42. -3
 43. 99
 44. -40
 45. 15
 46. -9
 47. 20
 48. 16
 49. 33
 50. 20
 51. $x = -\frac{3}{2}$

MAP 270 (T3) Issue 4

52. $x = 5$
53. $x = -2$
54. $x = -5$
55. $x = 1$
56. $x = -4$
57. $x = 1$
58. $3(x + 1) = 2$
 $3x + 3 = 2$
 $3x = -1$
 $x = -\frac{1}{3} = -1/3$
59. $x = -3$
60. $x = -3$
61. 16
62. 4
63. 4
64. $\frac{16}{25}$
65. 64
66. 0.16
67. 0.0064
68. 0.0016
69. 0.0004
70. 0.008
71. 0.125
72. 8
73. 8
74. 125
75. 0.00032
76. 0.03125
77. 32
78. 32
79. 3125
80. 0.008
81. -0.008
82. $\pi - 3 + 4 - \pi = 1$
83. -.027
84. $2\frac{2}{3} + 3\frac{3}{4} - 5\frac{1}{10}$
 $= 2 + 3 - 5 + \frac{2}{3} + \frac{3}{4} - \frac{1}{10}$
 $= \frac{2}{3} + \frac{3}{4} - \frac{1}{10}$
 $= 1\frac{19}{60} = 1\ 19/60$
85. 200
86. $26 \times 40 = 1040$ (miles)
 $26 - 6 = 20$
 $1040 \div 20 = 52$ miles per hour
 $52 - 40 = 12$ mph faster
87. $180 \div 3 = 60$ mi
88. $60 \times 4 = 240$ mi
89. $\frac{66}{360} \times 60^2 \pi = 660\pi = 660$ pi
90. $30 \times 2 + 5 \times 2 + 4(15 - 5)$
 $= 60 + 10 + 40$
 $= 110$

Answer Key

1. $2\frac{2}{3} \times 60 = 120 + 40 = 160$ min

2. $0.85 \times 3000 = \boxed{2,550}$

3. 30

4. $.14 \times .7 = .098$

5. 15

6. 20%

7. $4\frac{1}{16} = 4 \frac{1}{16}$

8. $44 \div 5 = 8R4$
 $8 + 1 = \boxed{9}$ cars

9. 30

10. Method I)
 $\frac{1}{2}(5 + 35) = \boxed{20}$

Method II)
 $35 - 5 = 30$
 $30 \div 2 = 15$
 $15 + 5 = \boxed{20}$

11. 1-round: $2 \times (13 + 23) = 72$ (ft) = 24 (yd)
 5-round: $5 \times 24 = \boxed{120}$ (yd)

12. $50 \div 5 = 10$ cm (diameter)
 circumference = $10\pi = 31.4$ (cm)
 five cir. = $5 \times 31.4 = \boxed{157}$ (cm)

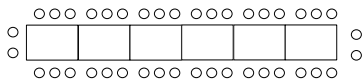
13. $n = 1, 6 + 2 = 8$
 $n = 2, 8 + 2 = 10$
 $n = 3, 10 + 2 = 12$
 $n = 100, 6 + 200 = \boxed{206}$

14. $85 + 92 + 96 = 273$
 $273 \div 3 = 91$

15. $93 \times 4 = 372$
 $372 - 273 = \boxed{99}$

16. $2(2 + 3) = 10$ (people each table)
 $40 \div 10 = \boxed{4}$ tables

17. $40 - 4 = 36$
 $36 \div 6 = \boxed{6}$ tables

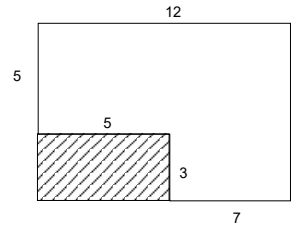


18. $40 - 6 = 34$
 $34 \div 4 = 8 R 2$
 $8 + 1 = \boxed{9}$ tables



19. $81 - 25 = 56$

$56 \div 7 = 8$
 $(12 + 8) \times 2 = \boxed{40}$ in



20. $50 \times 5\% = 50 \times .05 = \2.50

21. 0.0004

22. 36

23. 110

24. .098

25. 0.089

26. $\frac{14}{3} = 14/3$

27. $2^9 = 8^3$

28. -4

29. $x = 9$

30. $\frac{7}{10} = 7/10$

$30\frac{1}{15}$
 $10\frac{5}{15}$
 $+$
 $20\frac{9}{15} = 61$

32. x^{12}
 $\square = 12$

33. $54 \times 2 = 108$
 $54 \times \frac{1}{9} = 6$
 $108 + 6 = 114$

34. $6 \times 5 \div 2 = 15$ chords

35. $60 \times 5\% = 60 \times 0.05 = 3$
 $60 + 3 = \$63.00$

36. $\frac{1}{2} \times 6 \times 8 = 24$

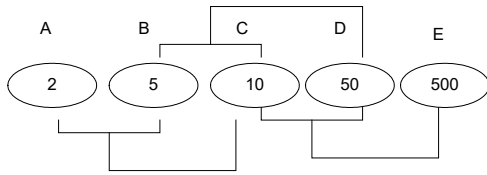
37. $\Delta ABC = 30 = \frac{1}{2} \times BH \times AC = \frac{1}{2} \times BH \times 13$
 $BH = \frac{60}{13} = 60/13$

38. $63.75 \div 5 = \$12.75$

39. 19

MAP 270 (T3) Issue 5

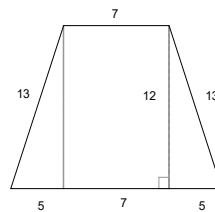
40. 567 (cards)
See the following figure.



$$2+5+10+50+500 = 567$$

41. 56
42. -5
43. 14
44. -9
45. 27
46. -27
47. -3
48. 17
49. 28
50. 20
51. $x = -1$
52. $x = -1$
53. $x = 4$
54. $10 - 2(2.5 - 3x) = 1 - 2(2x + 1.5)$
 $\Rightarrow 10 - 5 + 6x = 1 - 4x - 3$
 $\Rightarrow 5 + 6x = -4x - 2$
 $\Rightarrow 10x = -7$
 $\Rightarrow x = -0.7$
55. $10 - 0.4x + 1 = 3$
 $\Rightarrow -0.4x + 11 = 3$
 $\Rightarrow -0.4x = -8$
 $\Rightarrow x = 20$
56. D
 $2x - 4 = 2x - 4$
 $0 = 0$
which means x can be anything.
57. $x = -3$
58. $x = -10$
59. $18/5$
60. $\frac{1}{2}x + \frac{2}{3}x = 14$
 $\Rightarrow 6(\frac{1}{2}x + \frac{2}{3}x) = 6 \times 14$
 $\Rightarrow 3x + 4x = 84$
 $\Rightarrow 7x = 84$
 $\Rightarrow x = 12$
61. 12.5
62. 25
63. 50

64. 4
65. 16
66. 25
67. 64
68. 100
69. 0.01
70. 0.04
71. 0.0625
72. 0.25
73. 1.5625
74. 0.015625
75. 6.25
76. 156.25
77. 625
78. 2500
79. -2
80. -4
81. 14.4
82. $2x - 3 = 12$
 $2x = 15$
 $x = 7.5$
83. $-2(x - 3) = 4(3x + 1)$
 $-x + 3 = 2(3x + 1)$
 $-x + 3 = 6x + 2$
 $7x = 1$
 $x = \frac{1}{7} = 1/7$
84. $A:B = 4:3$
 $A^2:B^2 = 16:9$
85. $\frac{1}{2}(7+17) \times 12 = 144$
86. $17 + 13 + 7 + 13 = 50$



87. $36 \text{ min} = 0.6 \text{ hr}$
 $\frac{24(\text{miles})}{0.6(\text{hour})} = 40 \text{ miles per hour}$
88. $x = 12$
89. $0, -\frac{1}{5}$
Ans = 0 & $-1/5$
90. The area of the larger circle \ the area of the smaller circle
 $= 12^2\pi - 10^2\pi$
 $= 44\pi$

Answer Key

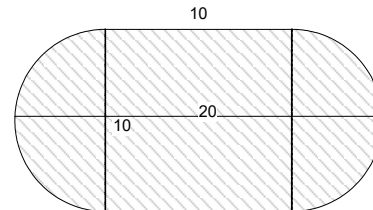
1. 0.16
2. $1\frac{1}{2} + 2\frac{1}{3} = 3 + (\frac{1}{2} + \frac{1}{3}) = 3\frac{5}{6} = 3\frac{5}{6}$
3. $6\frac{5}{6} = 6\frac{5}{6}$
4. 123 & 4 (R)
5. 225
6. 450 (min)
7. 12
8. $\frac{13}{15} = 13/15$
9. $30 \times 8 = 240$
 $240 - 210 = \$30$
10. C
 $36 = 6 \times 6 = 4 \times 9 = 3 \times 12 = 2 \times 18 = 1 \times 36$
(6, 6) is not good as they must be different.
(4, 9) is the only answer.
Their difference is $9 - 4 = 5$.
11. $Speed_{avg} = \frac{D_{tot}}{T_{tot}} = \frac{365+245}{6+4} = \boxed{61 \text{ mph}}$
12. A
 $\frac{10}{5} = 2$
 $2^2 = 4$ times
13. 50
14. { 25, 50, 100 }
15. Let
 $x = \# \text{ daughters}$
 $3x + 1 = \# \text{ sons}$
Each daughter has $x - 1$ sisters.
 $3x + 1 = 5(x - 1)$
 $2x = 6$
 $x = 3$ (daughters)
 $3x + 1 = 10$ (sons)
 $10 + 3 = \boxed{13 \text{ (children)}}$
16. $8 \text{ lb } 12 \text{ oz} + 8 \text{ oz} = \boxed{9 \text{ lb \& } 4 \text{ oz}}$
17. 14
18. $28 \div 14 = 2$
 $98 \div 14 = 7$
 $196 \div 14 = 14$
 $2 + 7 + 14 = 23$
19. $48 \div 6 = 8$
 $2(6 + 8) = \boxed{28 \text{ in}}$
20. $800 \times 15\% \times 2 = \boxed{240}$
21. -0.008
22. 27
23. 120
24. .0125
25. 0.0144
26. 4
27. -42
28. -10
29. $x = \frac{20}{3} = 20/3$
30. 640
 $\frac{21}{30}$
 $-\frac{5}{5}$
31. $\frac{16-\frac{30}{8}}{30-15} = 8/15$
32. 0.027
33. $5^8 = (5^2)^4 = 25^4$
 $\square = 4$
34. $400 \times 60\% = \$240.00$
35. $400 - 240 = \$160.00$
36. $2,000 \times 0.95 = 1,900$
 $1,900 \times 0.03 = \$57.00$
37. $60 \div 1.2 = 50$
38. $\frac{1}{2}(8 + 16) \times h = 12 \times h = x^2$
 $h = 3$
 $x = 6$
 $4 \times 6 = 24$
39. $3\frac{11}{12} = 3\frac{11}{12}$
40. $(120 - 96) \div 120 = .2 = 20\%$
41. 10
42. -7
43. 13
44. -18
45. 26
46. 0
47. 72
48. 41
49. -2
50. 12
51. $x = -2$
52. $x = -2$
53. $x = 3$
54. $-0.5x - 4 = 5 - 1.5x$
 $\Rightarrow 2x = 9$
 $\Rightarrow x = 4.5$
55. $x = -5$
56. $x = 1$
57. $x = -2$
58. $x = 4$

MAP 270 (T3) Issue 6

59. 3
60. $x = 3$
61. -5
62. -8
63. -10
64. -0.1
65. -0.2
66. -0.25
67. -0.5
68. -1.25
69. -0.125
70. -2.5
71. -12.5
72. -25
73. -50
74. 4
75. 16
76. 25
77. 64
78. 100
79. 0.01
80. 0.04
81. $2\frac{1}{4}$
82. $9\frac{7}{48} = 9\frac{7}{48}$
83. 5
84. -.49
85. $\frac{8}{3} \div \frac{16}{5} \div \frac{5}{3} = \frac{8}{3} \times \frac{5}{16} \times \frac{3}{5}$
 $= 1/2$
86. $3^6 \div 9^2 = 3^{6-4} = 3^2$
 $\square = 2$
87. $\frac{3}{8} = 0.375 = 37.5\%$
88. $x + \frac{1}{4} = 2x - 4$
 $x = 4\frac{1}{4} = 4\frac{1}{4}$
89. $4(x - 1) + 5(x + 2) = 3(x - 8)$
 $4x - 4 + 5x + 10 = 3x - 24$
 $9x + 6 = 3x - 24$
 $6x = -30$
 $x = -5$
90. $3x = 20 - 2$
 $3x = 18$
 $x = 6$

Answer Key

1. $0.4 = 40\%$
2. 4
3. 9
4. $\frac{3}{2} \times \frac{4}{3} \times \frac{5}{4} \times 144 = \boxed{360}$
5. $4\frac{13}{24} = 4\frac{13}{24}$
6. $\frac{5}{7}$
7. $A = 56$
8. $882 \div 9 = 98$
9. $\frac{1}{21}$
10. $750 \div 50 = \boxed{1.5 \text{ gal per sec}}$
11. $600 \div 1.5 = 400 \text{ sec} = \boxed{6 \text{ min } 40 \text{ sec}}$
12. Brian:
 $\frac{1}{6} \times 300 = 30$
 $50 + 30 = 80$
13. C
 Alex: $\frac{1}{6} \times 300 = 50$
 Brian: 80
 Calvin: $\boxed{95}$
 $300 - 50 - 80 = 170$
 $170 \div 2 = 85$
 $85 + 10 = \boxed{95}$
14. $54 - 15 - 3 \times 9 = 12$
 $\frac{1}{2} \times 12 \times 9 = 54$
 $54 + 9^2 = \boxed{135}$
15. $63 \text{ lb } 8 \text{ oz} - 36 \text{ lb } 9 \text{ oz}$
 $= \boxed{26 \text{ lb \& } 15 \text{ oz}}$
16. $10 \times 10 = 100$ (square area)
 $\frac{1}{2}(20 \times 10) = 100$
 $x = \boxed{10 \text{ in}}$
17. A = 1
 B = 5
 C = 3
 D = 7
 $1535 \times 5 = 7675$
 $C + D = 3 + 7 = \boxed{10}$
18. $3.25 \times 200 = 650$
 $15.75 \times 6 = 94.5$
 $650 + 94.50 = \boxed{\$744.50}$
19. $343 \div 7 = \$49.00$
20. $35 \times 4 = 140$
 $140 - 50 = 90$
 $90 \div 3 = \boxed{30 \text{ pounds}}$
21. $0.07^2 = 0.0049$
22. 54
23. $\frac{7}{8} = 7/8$
24. $1\frac{35}{36}$
25. 12.5
26. 0.008
27. $1.1 + 1.3 - 0.4 \times 0.3 = 2.28$
28. $(2 \times 3) \times (3 \times 4) \times (4 \times 5) = 6 \times 12 \times 20$
 $\square = 20$
29. -7
30. $x = -6$
31. $(\frac{1}{2} \times \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} \times \frac{5}{6})^2 = (\frac{1}{6})^2 = \frac{1}{36} = 1/36$
32. 9
33. 5
34. 16
35. $2,000 \times 0.8 = 1,600$
 $1,600 \times 0.05 = \$80.00$
36. $60 \times 20\% = 60 \times 0.2 = 12$
 $60 - 12 = \$48.00$
37. C
 $1 - 20\% = 0.8$
 2nd time: $0.8 \times 0.8 = 0.64$
 3rd time: $0.8 \times 0.64 = 0.512$
 4th time: $0.8 \times 0.512 = 0.4096$
38. 20 yd



39. $420 \times .3 = \$126.00$
40. $80 \times 80\% = 80 \times .8 = \64.00
41. -1
42. -4
43. 4
44. -51
45. 15
46. 60
47. 99
48. 41
49. 8
50. 15
51. $x = -4$

MAP 270 (T3) Issue 7

52. $x = 2$
53. $x = -1$
54. $x = 1$
55. $10 - 0.4x + 1 = 3$
 $\Rightarrow -0.4x + 11 = 3$
 $\Rightarrow -0.4x = -8$
 $\Rightarrow x = 20$
56. $t=32$
 $4(\frac{1}{4}t + \frac{1}{2}t) = 4(24)$
 $t + 2t = 96$
 $3t = 96$
 $t = 32$
57. $\frac{1}{2}x - \frac{3}{5} = \frac{3}{4}$
 $\Rightarrow \frac{10}{20}x - \frac{12}{20} = \frac{15}{20}$
 $\Rightarrow 10x - 12 = 15$
 $\Rightarrow 10x = 27$
 $\Rightarrow x = 2.7$
58. Multiply 6 to both sides. We have
 $6(\frac{1}{2}x - \frac{4}{3}) = -5$
 $\Rightarrow 3x - 8 = -5$
 $\Rightarrow 3x = 3$
 $\Rightarrow x = 1$
59. $x = 2$
60. Multiply both sides by 6, then we get
 $30 - 2(2x-3) = 3(3x-1)$
 $30 - 4x+6 = 9x -3$
 $36-4x=9x-3$
 $13x = 39$
 thus $x = 3$
61. 0.0625
62. 0.25
63. 1.5625
64. 0.015625
65. 6.25
66. 156.25
67. 625
68. 2500
69. 125
70. 8
71. 0.125
72. 0.008
73. 3125
74. 2
75. 4
76. 5
77. 8
78. 10
79. 0.1
80. 0.2
81. $\frac{1}{2} \times 4 = 2$
82. $\frac{29\frac{28}{24} - 28\frac{15}{24}}{1\frac{13}{24}} = 1\frac{13}{24} = 1\frac{13}{24}$
83. 8
84. $\frac{8}{3} \times \frac{25}{12} \times \frac{21}{10}$
 $= \frac{2}{3} \times \frac{25}{3} \times \frac{21}{10}$
 $= \frac{2}{1} \times \frac{25}{3} \times \frac{7}{5}$
 $= \frac{1}{1} \times \frac{5}{3} \times \frac{7}{1}$
 $= \frac{35}{3}$ or $11\frac{2}{3} = 11\frac{2}{3}$
85. 5
86. 0.5^3
 $= 0.125$
 $= 12.5\%$
87. $4(x - 1) + 5(x + 2) = 3(x - 8)$
 $4x - 4 + 5x + 10 = 3x - 24$
 $9x + 6 = 3x - 24$
 $6x = -30$
 $x = -5$
88. $x = -2$
89. $3x - 4 = 20$
 $3x = 24$
 $x = 8$
90. 4 possible arrangements
 DACBE
 DACEB
 BECAD
 EBCAD

Answer Key

1. 0.034
2. 8
3. $\frac{2}{3}$
4. $\frac{13}{20} = 13/20$
5. $104\frac{1}{12} = 104 \frac{1}{12}$

$$\begin{array}{r} 3\frac{2}{3} \\ + 100\frac{5}{12} \\ \hline 103\frac{13}{12} = 104\frac{1}{12} \end{array}$$
6. $\frac{25}{9} = \left(\frac{5}{3}\right)^2 = \left(1\frac{2}{3}\right)^2$
 $a = \boxed{2}$
7. 12449
8. 7
 $1^2 = 1, 2^2 = 4, \dots, 7^2 = 49$
9. $30 \div 2.5 = 12$ packets
10. $3 \times 10 = 30$ (total)
 $30 - (10 + 12) = 8$ years old (Charlie)
11. D
12. $80 \div 4 = 20$
 $20^2 = 400 \text{ ft}^2$
 $10^2\pi = 314 \text{ ft}^2$
 $400 - 314 = \boxed{86 \text{ ft}^2}$
13. $401 \div 5 = 80\text{R}1$
 $R = 1$
14. $\frac{1}{2} \times 6 \times 12 = 36$
 $6 \times 6 = 36$
 $x = 6$
15. $40\% \times 20 = .4 \times 20 = 8$
16. $720 \div 12 = 60$
 $60 + 50 + 50 = \boxed{160}$
17. C
 Nancy: 46 sec
 $\boxed{\text{Jennifer: 45 sec}}$
 Alex: 50 sec
 Joy: 45.8 sec
18. $24 \div 3 = 8$ rows
 $15 \div 3 = 5$ columns
 $8 \times 5 = \boxed{40}$ (plates)
19. $14 \div 3\frac{1}{2} = \boxed{4}$
20. $12 \div \frac{1}{3} = \boxed{36}$
21. -0.027
22. 1
23. $\frac{4}{3} = 1 \frac{1}{3}$
24. .007
25. 0.00032
26. $\frac{25}{36}$
27. 132
28. $3.14 \times .03 = .0942$
29. $2(x - 1) + 3(x + 1) = 6$
 $5x + 1 = 6$
 $x = 1$
30. $(1 + \frac{1}{2})(1 + \frac{1}{3})(1 + \frac{1}{4})(1 + \frac{1}{5})(1 + \frac{1}{6}) = \frac{3}{2} \times \frac{4}{3} \times \frac{5}{4} \times \frac{6}{5} \times \frac{7}{6} = \frac{7}{2}$
 $\frac{7}{2}$
31. 8
32. 0.0025
33. 12
34. $7\frac{7}{10} = 7 \frac{7}{10}$
35. $80 \times 70\% = 80 \times 0.7 = \56
36. $25^2 = \underline{20}^2 + 15^2$
 $\text{Ans} = 20$
37. $\frac{1}{2}(12) = 6$ in
38. $20 \times 1.5 = 30$
 $12 \times 30 = \$360$
39. $22 \times 14 \times 12 / 231 = 16$
 Note $231 = 11 \times 21$
40. $273 \div 3 = 91$
 $91 \div 7 = 13$
 $273 = 3 \times 7 \times 13$
 $\text{Ans} = \{ 3, 7, 13 \}$
41. 0
42. -3
43. 13
44. -59
45. 20
46. -4
47. 35
48. 5
49. 5
50. 48
51. $x = -5$
52. $x = 2$
53. $x = -5$
54. $y = -7/3$
55. $x = -3$
56. $x = 1$
57. $x = 9$

MAP 270 (T3) Issue 8

58. $x = 3$
59. $x = 3$
60. Let x be the length, then we have
 $2(x+6) = 28$
 $\Rightarrow 2x + 12 = 28$
 $\Rightarrow 2x = 16$
 $\Rightarrow x = 8$
61. 0.25
62. 0.5
63. 1.25
64. 0.125
65. 2.5
66. 12.5
67. 25
68. 50
69. 4
70. 16
71. 25
72. 64
73. 100
74. 0.01
75. 0.04
76. 0.0625
77. 0.25
78. 1.5625
79. 0.015625
80. 6.25
81. $1/8$
82. 4
83. 0.09
84. $2^{12} = 4^6$
 $8^2 = 4^3$
 $6 - 3 = 3$
85. $4^2 \times 2^3 = 2^4 \times 2^3 = 2^7$
Ans = 7
86. -49
87. $100 - 4(2.5)^2\pi = 100 - 25\pi$
88. $1/2(3 \times 4) = 6$
89. $49 - 4 \times 6 = 25$
90. The unit price is $\frac{19}{3}$ per apple. Thus, the number of apples you can purchase with $\$1.52=152\text{¢}$ is
 $\frac{152}{\frac{19}{3}} = \frac{152 \times 3}{19} = 24$ apples.

Answer Key

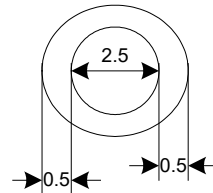
1. 0.5
2. 3
3. $1 \frac{3}{10}$
4. 36
5. $\frac{7}{5} \div \frac{49}{15} = \frac{7}{5} \times \frac{15}{49} = \frac{3}{7} = 3/7$
6. $\frac{23}{30} = 23/30$
7. $\frac{3}{7} = \frac{9}{21}$
A = 9
8. 12350
9. 8 (in)
10. $13 \times 3 = 39$
 $10 \times 2 = 20$
 $39 - 20 = \underline{19}$
11. the area of A = $464 - 20^2 = 64 = 8^2$
the perimeter of A = $4 \times 8 = 32$ in
12. 24
13. A
14. $1 = 1$
 $3 = 1+2$
 $6 = 1+2+3$
 $10 = 1+2+3+4$
 $1 + 3 + 6 + 10 = 20$
15. $0.24 \times 1.5 \times 0.5$
 $= 0.24 \times 0.75$
 $= 0.06 \times (4 \times 0.75)$
 $= \underline{0.18}$
16. $30 + 5^2 = \underline{55}$

	increment from the previous night	#nickels
1 st night	$1 = 1^2$ +	1
2 nd night	$4 = 2^2$ +	5
3 rd night	$9 = 3^2$	14
4 th night	$16 = 4^2$	30
5 th night	$25 = 5^2$	55

17. 385
See the following table.

	increment from the previous night	#nickels
1 st night	$1 = 1^2$ +	1
2 nd night	$4 = 2^2$ +	5
3 rd night	$9 = 3^2$	14
4 th night	$16 = 4^2$	30
5 th night	$25 = 5^2$	55
6 th night	$36 = 6^2$	91
7 th night	$49 = 7^2$	140
8 th night	$64 = 8^2$	204
9 th night	$81 = 9^2$	285
10 th night	$100 = 10^2$	385

18. B
 $2.94 \div 10 = 0.294$ (per ounce)
 $1.56 \div 6 = 0.26$ (per ounce)
6-oz cheaper
19. $0.75 \times 2 = 1.5$
 $1.5 - 1.25 = \$0.25$
20. $(4 \div 2) \times 1.39 = 2.78$
 $4 \times 0.9 = 3.6$
 $3.6 - 2.78 = \$0.82$
21. $\frac{4}{9} = 4/9$
22. 1
23. $\frac{4}{5} = 4/5$
24. .001
25. 0.027
26. $(2-1) + (4-3) + (6-5) + (8-7) + (10-9) = 5$
27. $2.1^2 = 4.41$
28. $314 \times 5 = 1570$
 3.14×0.05
four decimal places altogether
 $= 0.1570 = 0.157$
29. $x = 4$
30. $\frac{1}{7} + \frac{1}{3} = \frac{49}{30} = \frac{1}{7} + \frac{10}{49} = \frac{17}{49} = 17/49$
31. $2^{10} \div 2^3 = 2^7$
 $\square = 7$
32. 0.000125
33. -112
34. $2 \frac{5}{12} = 2 \frac{5}{12}$
35. $2.5 + 2 \times 0.5 = 3.5$ in



36. $90 - 72 = 18$
 $18 \div 90 = .2 = 20\%$
37. 60°
38. $64 = 8 \times 8$
 $8 \times 4 = 32$ in
39. $3 \times 4.5 = 13.5$ (cm²)
40. $\frac{1}{2}(12 \times 5) = 30$
41. 3
42. -4

MAP 270 (T3) Issue 9

- | | |
|--|--|
| 43. 6 | 64. -2 |
| 44. -26 | 65. -4 |
| 45. 16 | 66. -5 |
| 46. -90 | 67. -8 |
| 47. 54 | 68. -10 |
| 48. 69 | 69. -0.1 |
| 49. -20 | 70. -0.2 |
| 50. 32 | 71. -0.25 |
| 51. $x = -2$ | 72. -0.5 |
| 52. $x = -38$ | 73. -1.25 |
| 53. $x = 4$ | 74. -0.125 |
| 54. $x = -3$ | 75. -2.5 |
| 55. $x = -2$ | 76. -12.5 |
| 56. $5(x + 1) - 7(x - 3) = 28$ | 77. -25 |
| $5x + 5 - 7x + 21 = 28$ | 78. -50 |
| $-2x = 2$ | 79. 4 |
| $x = -1$ | 80. 16 |
| 57. $\frac{x+5}{2} + \frac{1}{4} = \frac{3}{4}$ | 81. $(-1)^{\text{even}} = 1$ |
| $\Rightarrow \frac{2x+10}{4} + \frac{1}{4} = \frac{3}{4}$ (common denominator) | [Note: $(-1)^{\text{even}} = 1, (-1)^{\text{odd}} = -1$] |
| $\Rightarrow \frac{2x+10+1}{4} = \frac{3}{4}$ | 82. $\frac{45 \times 16}{2880} = \frac{720}{2880} = \frac{1}{4}$ |
| $\Rightarrow \frac{2x+11}{4} = \frac{3}{4}$ | 83. 0.125 |
| $\Rightarrow 2x + 11 = 3$ | 84. 17 |
| $\Rightarrow 2x = -8$ | 85. 5 |
| $\Rightarrow x = -4$ | 86. 2 |
| 58. $24/7$ | 87. $2(x - 1/2) + 3(x + 1/3) = 60$ |
| 59. $x=9$ | $5x = 60$ |
| 60. D | $x = 12$ |
| All numbers, infinitely many solutions | 88. $y = 2$ |
| 61. 156.25 | 89. 192 |
| 62. 625 | 90. $x = 180^\circ - 2(30^\circ) = 120^\circ$ |
| 63. 2500 | |

Answer Key

1. 10
2. 8 & 3 (R)
3. 2
4. $9^3 = (3^2)^3 = (3^3)^2 = 27^2$
 $\square = 2$
5. 23
6. $\frac{5}{24} = 5/24$
7. A = 39
8. 31
9. $8 \times 4 = 32$
10. $120 \div 40 = 3$
1 min 30 sec = 1.5 min
 $3 \times 1.5 = \boxed{4.5 \text{ min}}$
11. $300 \div 40 = \frac{15}{2}$
 $\frac{15}{2} \times 1\frac{1}{2} = \frac{15}{2} \times \frac{3}{2} = \frac{45}{4} = 11\frac{1}{4} = 11 \text{ min} \& 15 \text{ sec}$
12. $38 \div 2 = 19$ (half-perimeter)
 $19 - 10 = 9$
 $10 \times 9 = \boxed{90 \text{ in}^2}$
13. D = 5
C = 10
B = $10 + 2 = 12$
A = $12 + 6 = \boxed{18}$
14. A
15. 125%
16. $1 = 1$
 $3 = 1+2$
 $6 = 1+2+3$
 $12 = 1+2+3+6$
 $1 + 3 + 6 + 12 = 22$
17. $8 \times 6 = 48$
 $\frac{1}{2} \times 48 = \boxed{24 \text{ in}^2}$
18. Method I)
 $12.5 + 2 \times 7.25$
 $= 12.5 + 14.5$
 $= \boxed{27}$

Method II)
 $12\frac{1}{2} + 2 \times 7\frac{1}{4}$
 $= 12\frac{1}{2} + 14\frac{1}{2}$
 $= 27$
19. 80
20. $50 + 75 = 125$
 $50 + 125 = 175$
 $175 \times 2 = \boxed{\$350}$
21. $\frac{1}{10} = 1/10$
22. -9
23. 1.1
24. .064
25. .002
26. 10,000
27. 250%
28. $30\% \times 24 = 7.2 = 7 \text{ hr} \& 12 \text{ min}$
29. 35%
30. 16
31. 4.5
32. $5 \times \frac{17}{60} - \frac{1}{6} = \frac{15}{12} = 1\frac{1}{4} = 1 \text{ } 1/4$
33. $156 = 26 \times 6$
 $130 = 26 \times 5$
LCM = $26 \times 6 \times 5 = 780$
34. $6\frac{19}{48} = 6 \text{ } 19/48$
35. $40 \div 8 = 5$
 $3 \times 5 \times 5 = 75 \text{ in}^2$
36. $9 \times 3 = 27$ (sum)
 $27 - 5 - 11 = 11$ (Charles)
37. $11^2\pi - 10^2\pi = 21\pi = 21 \text{ pi}$
38. 60°
39. $300 \div 20 = 15$
40. $18 \div 60 = 0.3$ (hr)
 $80 \times 0.3 = 24 \text{ mi}$
41. $x = 4$
42. $4x = 22$
 $x = 5.5$
43. $x = 2$
44. $x = -3$
45. $x = 3$
46. $x = -1$
47. $n = -12$
48. $x = -1$
49. $x = -1$
50. $x = -5$
51. 25
52. 64
53. 100
54. 0.01
55. 0.04
56. 0.0625
57. 0.25

MAP 270 (T3) Issue 10

58. 1.5625
59. $1/64$
60. 6.25
61. 156.25
62. 625
63. 2500
64. 125
65. 8
66. 0.125
67. 0.008
68. 3125
69. 32
70. 0.03125
71. $\frac{1}{4} = 1/4$
72. $5x - 2 = 4x + 6$
 $x = 8$
73. C
74. $80\% \times 15 = 12$
 $5 + 15 = 20$
 $20 \times 0.75 = 15$
 $15 - 12 = 3$ games
75. $\angle CBA = 80^\circ, x = \frac{1}{2}(80) = 40$
76. $5\frac{1}{4} \times 24 = 126$ (miles)
77. A
 $r = 5$
area = 25π
shade area = $100 - 25\pi$.
78. Group them every 3 numbers. The sums of these groups are
0, 3, 6, ..., 96
 $97 + 98 - 97 = 96$
79. D
The radius of a small circle is 2, so each circle has an area of 4π , therefore, four circles have a combined area of 16π . (Amazingly, the area is the same as the previous problem.) The area of the shaded region is $64 - 16\pi$.
80. $120 + 110 + 108 + 112 = 450$
The total commission he was to receive for 5 weeks:
 $125 \times 5 = 625$
So, he must receive
 $625 - 450 = \$175$ for the 5th week commission.