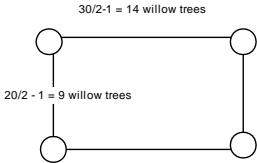
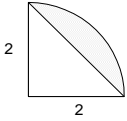


# Answer Key

1. 1024
2.  $102400 + 2,576 = 104,976$
3. 2704
4. 3844
5. 324
6. 784
7. 1444
8. 2304
9. 3364
10. 529
11.  $22 \div 2 = 11$   
 $11 - 4 = 7$  ft
12.  $8^2 = 64$   
 $4 \times 8 = 32$  ft
13. 2 ft. = 24 in  
 $12 + 16 + 24 = 52$  in
14. There are  $(9+14) \times 2 = 46$  trees needed.
 

$30/2 - 1 = 14$  willow trees


15.  $3.14 \times 11^2 = 379.94$  sq. ft. (outer area)  
 $3.14 \times 9^2 = 254.34$  sq. ft. (inner area)  
 $379.94 - 254.34 = 125.6$  sq. ft. (area of the shaded region)
16. 1.14
 



Note that area of the shaded region  
 $= \frac{1}{4}(\text{circle}) - \Delta$   
 $= \frac{1}{4} \times (\pi 2^2) - \frac{1}{2}(2 \times 2)$   
 $= \pi - 2 = 1.14$
17. 2.28
 

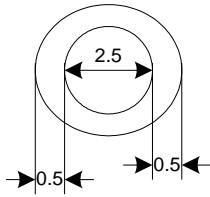
Method (I)  
 $2(\pi - 2) = 2.28$

Method (II)  
 $2(\text{quarter circle}) \setminus \text{square}$   
 $= 2\pi - 4 = 2.28$
18. 1.72
 

Area of the shaded region  
 $= \text{the square} - \text{the leaf}$   
 $= 4 - (\text{previous answer})$   
 $= 4 - 2(\pi - 2)$   
 $= 4 - 2\pi + 4$   
 $= 8 - 2\pi$   
 $= 8 - 6.28$   
 $= 1.72$
19.  $100 \times 2 - 4 \times 10 = 160$
20.  $(100 \times 2) - (8 \times 4) = 200 - 32 = 168$
21.  $7.50 \times 7 \times 3 \times 4 = 630$
22.  $24 \times (1 - 75\%) = 6$
23.  $1\frac{1}{2} \times 2 = 3$  inches
24.  $20 / ((16/4) \times 1) = 5$
25.  $77 / 7 \times 1 = 11$
26.  $2 \times 12 \times (1 - 1/8) = 21$
27.  $58 - 12 \times (4 + 5/6) = 0$
28.  $25 \times (1 - 4/5) = 5$
29.  $70 / (1 - 1/8) = 80$
30.  $30 / (3 - 1) \times 1 = 15$
31.  $24 \times (1/4) = 6$
32.  $60 \times 2 + 60 / 4 \times 1 = 135$
33.  $12 \times (11/4) = 33$
34.  $9 \times (10/2) = 45$
35.  $2 \times (20 + 20) / 2 - 4 = 36$
36.  $45 \times (3/5) = 27$
37. (a)  $(14 + 4) / 2 = 9$   
(b)  $5 \times (14 + 4) / 2 = 45$
38. (a)  $3 \times 12 / 4 = 9$   
(b)  $3 \times 20 / 4 = 15$   
(c)  $(3 \times 12 / 4) \times (3 \times 20 / 4) = 135$
39. (a)  $60 \times 130 = 7800$   
(b)  $0.4 \times 260 = 104$   
(c)  $0.65 / 1.3 = 0.5$
40. (a)  $-.6 \times -.2 = 0.12$   
(b)  $-.3 \times -.1 \times -.2 = -0.006$
41. 16
42.  $1/4$
43. 30
44. 2500

# MAP 280 (Spring, 2024) Issue 5

45. 20  
 46.  $\frac{1}{2}$   
 47.  $\frac{1}{3}$   
 48. 30  
 49. 11  
 50. 125  
 51.  $\frac{4}{9} = 4/9$   
 52. 1  
 53.  $\frac{4}{5} = 4/5$   
 54. .001  
 55. 0.027  
 56.  $(2-1) + (4-3) + (6-5) + (8-7) + (10-9) = 5$   
 57.  $2.1^2 = 4.41$   
 58.  $314 \times 5 = 1570$   
 $3.14 \times 0.05$   
 four decimal places altogether)  
 $= 0.1570 = 0.157$   
 59.  $x = 4$   
 60.  $\frac{1}{7} + \frac{1}{3} \div \frac{49}{30} = \frac{1}{7} + \frac{10}{49} = \frac{17}{49} = 17/49$   
 61.  $2^{10} \div 2^3 = 2^7$   
 $\square = 7$   
 62. 0.000125  
 63. -112  
 64.  $2\frac{5}{12} = 2\ 5/12$   
 65.  $2.5 + 2 \times 0.5 = 3.5$  in



66.  $90 - 72 = 18$   
 $18 \div 90 = .2 = 20\%$   
 67.  $60^\circ$   
 68.  $64 = 8 \times 8$   
 $8 \times 4 = 32$  in  
 69.  $3 \times 4.5 = 13.5$  (cm<sup>2</sup>)  
 70.  $\frac{1}{2}(12 \times 5) = 30$   
 71. 1.0987

72.  $9 \times 6 - 4 \times 2$   
 $= 54 - 8$   
 $= \underline{46}$   
 73. January 2 at 9:31am  
 74.  $100 \div 4 \times 500 = \underline{12500}$  sheets  
 75. 12  
 76. 9  
 77. 2  
 78. 4  
 79. Carlos, Diana  
 80. 171  
 81.  $11 + 29 = 40$  (perimeter)  
 $40 \div 4 = 10$   
 $10^2 = \underline{100}$   
 82. 2(012) 6 numbers  
 1(022) 3 numbers  
 tot = 9 numbers  
 83.  $250 \times 0.8 = 200$  (red)  
 $250 \times 0.2 = 50$  (blue)  
 $50 \times 3 = 150$  (red must stay)  
 $200 - 150 = \underline{50}$   
 84.  $2 \times (8.6 + 6.4) = \underline{30}$   
 85. Let  $x + 2$  be # of chests.  
 $9x = 6(x + 2) + 3$   
 $3x = 2x + 4 + 1$   
 $x = 5$   
 $9x = \underline{45}$   
 86. 6 faces, so  $6 \times 2 = 12$  (x's)  
 4 spatial diagonals (y's)  
 $12 + 4 = \underline{16}$   
 87.  $10 \times 4 \times 3 = 120$   
 $20 + 19 + 18 + 17 + 16 + 15 = 105$   
 $105 + 14 = 119$   
 The nearest number is 7 hours. Not 8 hours.  
 88. LCM(5, 4) = 20  
 $20 \times \frac{2}{5} = 8$   
 $20 \times \frac{3}{4} = 15$   
 $8 + 15 - 20 = \underline{3}$   
 89.  $(1 + \frac{1}{4}) : (1 + \frac{1}{2}) = 1.25 : 1.5 = \underline{5 : 6}$   
 90. {123} and {234} are multiple of 3.  
 {124} and {134} are not.  
 So, the probability is  $\frac{1}{2}$  or 50%.

# Answer Key

- |   |   |
|---|---|
| 1. 1089   | 40. $9/49$  |
| 2. $108,900 + 3,325$<br>$= 112,225$                     | 41. $1/81$  |
| 3. 2809   | 42. $1/49$  |
| 4. 3969   | 43. 5   |
| 5. 289  | 44. -2  |
| 6. 729  | 45. $5/2$   |
| 7. 1369   | 46. -2  |
| 8. 2209   | 47. -2  |
| 9. 3249   | 48. -2  |
| 10. 196   | 49. $100/9$   |
| 11. $15.00 \times 7.5 \times 2 \times 2 = 450$          | 50. 6   |
| 12. $32 \times (1 - 50\%) = 16$                         | 51. $\frac{1}{8} = 1/8$   |
| 13. $(36 \times 2 + 36/9 \times 2)/5 = 16$              | 52. 1   |
| 14. $6 / ((16/8) \times 1) = 3$                         | 53. $\frac{9}{14} = 9/14$   |
| 15. $96/4 \times 3 = 72$                                | 54. $\frac{5}{3} \div 1 \frac{2}{3} = 1$  |
| 16. $2 \times 12 \times (1 - 1/2) = 12$                 | 55. 0.0009  |
| 17. $35 - 12 \times (2 + 1/3) = 7$                      | 56. $4 \frac{1}{3} = 4 \frac{1}{3}$   |
| 18. $12 \times (1 - 1/3) = 8$                           | 57. $12 \frac{5}{6} = 12 \frac{5}{6}$   |
| 19. $12 / (1 - 4/5) = 60$                               | 58. 214   |
| 20. $5280 \times (1 - 1/8) = 4620$                      | 59. 9.5   |
| 21. $48 \times (7/6) = 56$                              | 60. $4 \frac{1}{4} - 3 \frac{1}{3} = 1 \frac{1}{4} - \frac{1}{3} = \frac{15-4}{12} = \frac{11}{12} = 11/12$ |
| 22. $\frac{45}{60} = \frac{3}{4}$                       | $\frac{5}{18}$  |
| 23. $44/2 \times 5 = 110$                               | 61. $\frac{+ \frac{2}{17}}{\frac{3}{18}} = 17/18$   |
| 24. $8 \times (9/1) = 72$                               | 62. $x^5 = \sqrt{x^{10}}$ , a = 10  |
| 25. $3 \times 2 = 6$                                    | 63. -71   |
| 26. $2 \times (21 + 24) / 3 - 4 = 26$                   | 64. $3.60 \div 12 = 0.3$<br>$2.40 \div 6 = 0.4$<br>$0.4 - 0.3 = \$0.10$                                     |
| 27. $48 \times (4/3) = 64$                              | 65. GCF(84, 96) = 12<br>$84 \div 12 \times (96 \div 12) = 7 \times 8 = 56$ pieces                           |
| 28. (a) $(19+9)/2 = 14$<br>(b) $3 \times (19+9)/2 = 42$ | 66. A<br>$900 \div 300 \times 20 = 60$ (gallons)  |
| 29. $60 \times 0 + 60/3 \times 2 = 40$                  | 67. B<br>$600 \div 60 = 10$   |
| 30. $48/3 + 1 = 17$                                     | 68. G(-6, 6)  |
| 31. $5/11$  | 69. 1440  |
| 32. $5/31$  | 70. $30 \times 0.7 = 21$  |
| 33. $5/46$  | 71. A<br>\$1920   |
| 34. $8/9$   | 72. E<br>$0.8 \times 120 = 96$  |
| 35. $2/3$   |   |
| 36. $1/9$   |   |
| 37. $64/49$   |   |
| 38. $64/81$   |   |
| 39. $4/9$   |   |

# MAP 280 (Spring, 2024) Issue 6

$$96 - 6 = 90$$

$$90 \times 1.08 = \$97.20$$

73. E  
 $1.1^2 = 1.21$   
 $1.1^3 = 1.331$   
 $1.1^4 = 1.4641$

74. D  
 multiplying by  $\frac{5}{4}$

75. A  
 8
76. D  
 10,000,000,000

77. D  
 \$882

78. C  
 $\frac{243}{1024}$

79. B  
 \$1.07

80. C  
 $7^1 =_2 7$   
 $7^2 =_2 49$   
 $7^3 =_2 43$

$$7^4 =_2 01$$

$$7^{2011} =_2 43$$

Note:  $=_2$  means two end digits.

81. Dana  
 Dana is seated #2.

4	3	2	1
A	B	D	C

82. 125

83.  $\frac{1}{80}$   
 8 possible digits to be the first digit.  
 10 possible digits to be the last digit.

$$\frac{1}{8} \times \frac{1}{10} = \frac{1}{80}$$

84. 240

85. 7

86. 14

87. 49

88. 7.2

89. 80

90.  $\frac{7}{9}$

# Answer Key

1. 576
2.  $57,600 + 2,916 = 60,516$
3. 1936
4. 2916
5. 256
6. 676
7. 1296
8. 2116
9. 3136
10. 256
11.  $16/100$
12.  $8/125$
13.  $64/125$
14.  $49/100$
15.  $36/100$
16.  $81/100$
17.  $3/10$
18.  $27/125$
19.  $1/2$
20.  $5/10$
21.  $25 - (25/5 \times 2) = 15$
22.  $25 \times (1 - 80\%) = 5$
23.  $2\frac{1}{2} \times 2 = 5$  inches
24.  $40 / ((16/2) \times 1) = 5$
25.  $84 / 7 \times 2 = 24$
26.  $2 \times 12 \times (1 - 3/8) = 15$
27.  $44 - 12 \times (3 + 1/2) = 2$
28.  $24 \times (1 - 1/6) = 20$
29.  $75 / (1 - 3/8) = 120$
30.  $13 / (3 - 2) \times 2 = 26$
31.  $20 \times (3/4) = 15$
32.  $60 \times 0 + 60 / 4 \times 3 = 45$
33.  $12 \times (13/4) = 39$
34.  $9 \times (36/4) = 81$
35. (a)  $3 \times 6 / 2 = 9$   
(b)  $3 \times 4 / 2 = 6$   
(c)  $(3 \times 6 / 2) \times (3 \times 4 / 2) = 54$
36. (a)  $6 \times 9^2 = 486$   
(b)  $9^3 = 729$
37.  $4 \times \text{sqrt}(9 \times 72 / 2) = 72$
38.  $21 \times 2 = 42$
39.  $24 \times 2 + 24 / 8 \times 1 = 51$
40.  $120 \times (65 / 100) = 78$
41.  $1/2$
42.  $1/9$
43.  $1/10$
44.  $1/2$
45.  $1/2$
46.  $1/4$
47.  $1/2$
48.  $1/3$
49.  $1/64$
50.  $16/25$
51.  $\frac{1}{10} = 1/10$
52. -9
53. 1.1
54. .064
55. .002
56. 10,000
57. 250%
58.  $30\% \times 24 = 7.2 = 7$  hr & 12 min
59. 35%
60. 16
61. 4.5
62.  $5 \times \frac{17}{60} \frac{1}{6} = \frac{15}{12} = 1\frac{1}{4} = 1$  1/4
63.  $156 = 26 \times 6$   
 $130 = 26 \times 5$   
LCM =  $26 \times 6 \times 5 = 780$
64.  $6\frac{19}{48} = 6$  19/48
65.  $40 \div 8 = 5$   
 $3 \times 5 \times 5 = 75$  in<sup>2</sup>
66.  $9 \times 3 = 27$  (sum)  
 $27 - 5 - 11 = 11$  (Charles)
67.  $11^2\pi - 10^2\pi = 21\pi = 21$  pi
68.  $60^\circ$
69.  $300 \div 20 = 15$
70.  $18 \div 60 = 0.3$  (hr)  
 $80 \times 0.3 = 24$  mi
71.  $\frac{2}{3}$
72. 8
73. 3

## MAP 280 (Spring, 2024) Issue 7

74. 34

75. 63

76. 7 and 8

OB = 5

area of quarter circle =  $\frac{1}{4}(25\pi) = 6.25\pi$

a) area of the shaded region =  $6.25\pi - 12$

b)  $7$  and  $8$

77. 162

78. 71

79. 27

$57,064 - 56,200 = 864$

The number of gas actually consumed is

$12+20 = 32$

Note: 6 gal of gas is to fill the tank.

$$864 \div 32 = \boxed{27}$$

80. \$675

81. .246

82.  $1/2$

83. 35

84.  $3 \times 2 \times -7 = -42$

85. 320

86.  $2 \times (5+4+1) = \boxed{20}$

87. 35

88. 35%

89. 11

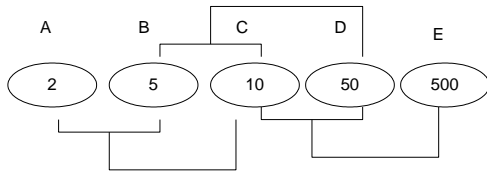
90. 9

# Answer Key

- |   |   |
|---|---|
| 1. 1296   | 37. $1/100$   |
| 2. $129,600 + 2,896$<br>$= 132,496$             | 38. 4   |
| 3. 676  | 39. 100   |
| 4. 2116   | 40. 25  |
| 5. 3136   | 41. 25  |
| 6. 4356   | 42. 8   |
| 7. 4761   | 43. $1/16$  |
| 8. 4489   | 44. 2   |
| 9. 4900   | 45. $2/3$   |
| 10. 5041  | 46. $16/625$  |
| 11. $9.00 \times 4.5 \times 3 \times 2 = 243$   | 47. $4/5$   |
| 12. $20 \times (1 - 55\%) = 9$                  | 48. -2  |
| 13. $(36 \times 3 + 36/9 \times 4)/4 = 31$      | 49. 10000   |
| 14. $16 / ((16/4) \times 1) = 4$                | 50. 5   |
| 15. $80/5 \times 1 = 16$                        | 51. 0.0004  |
| 16. $2 \times 12 \times (1 - 1/3) = 16$         | 52. 36  |
| 17. $34 - 12 \times (2 + 2/3) = 2$              | 53. 110   |
| 18. $12 \times (1 - 2/3) = 4$                   | 54. .098  |
| 19. $80 / (1 - 1/6) = 96$                       | 55. 0.089   |
| 20. $5280 \times (1 - 3/8) = 3300$              | 56. $\frac{14}{3} = 14/3$   |
| 21. $54 \times (11/6) = 99$                     | 57. $2^9 = 8^3$   |
| 22. $\frac{54}{60} = \frac{9}{10}$              | 58. -4  |
| 23. $46/2 \times 5 = 115$                       | 59. $x = 9$   |
| 24. $8 \times (21/3) = 56$                      | 60. $\frac{7}{10} = 7/10$   |
| 25. (a) $(5+3)/2 = 4$                           | 61. $\frac{30\frac{1}{15} + 10\frac{5}{15} + 20\frac{9}{15}}{60\frac{15}{15}=61} = 61$                                    |
| (b) $4 \times (5+3)/2 = 16$                     | 62. $x^{12}$<br>$\square = 12$  |
| 26. (a) $3 \times 3/3 = 3$                      | 63. $54 \times 2 = 108$<br>$54 \times \frac{1}{9} = 6$<br>$108 + 6 = 114$   |
| (b) $3 \times 6/3 = 6$                          | 64. $6 \times 5 \div 2 = 15$ chords   |
| (c) $(3 \times 3/3) \times (3 \times 6/3) = 18$ | 65. $60 \times 5\% = 60 \times 0.05 = 3$<br>$60 + 3 = \$63.00$  |
| 27. (a) $6 \times 0.3^2 = 0.54$                 | 66. $\frac{1}{2} \times 6 \times 8 = 24$  |
| (b) $0.3^3 = 0.027$                             | 67. $\Delta ABC = 30 = \frac{1}{2} \times BH \times AC = \frac{1}{2} \times BH \times 13$<br>$BH = \frac{60}{13} = 60/13$ |
| 28. $4 \times \text{sqrt}(36 \times 32/2) = 96$ | 68. $63.75 \div 5 = \$12.75$  |
| 29. $60 \times 0 + 60/3 \times 2 = 40$          | 69. 19  |
| 30. $\frac{25}{60} = \frac{5}{12}$              |   |
| 31. $1/16$                                      |   |
| 32. 4   |   |
| 33. $1/36$                                      |   |
| 34. $1/49$                                      |   |
| 35. 16  |   |
| 36. $1/81$                                      |   |

# MAP 280 (Spring, 2024) Issue 8

70. 567 (cards)  
See the following figure.



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

71.  $64\pi$   
72. 7 teams

# teams	# games
2	1
3	3
4	$3+3 = 6$
5	$6+4 = 10$
6	$10 + 5 = 15$
7	$15 + 6 = 21$

73.  $\text{GCD}(143, 187) = 11$   
Each pencil cost 11¢ or 1¢ but ruled out.  
 $187 \div 11 = 17$

$$143 \div 11 = 13$$

$$17 - 13 = \boxed{4 \text{ more pencils}}$$

74. 48

75. 80%

76.  $\frac{2}{7}$



77.

78. 36

79. 4

80.  $35^\circ$

81. 33

82. 24,000

83. 15

84.  $32 : 17$

85.  $33\frac{1}{3}\%$

86. 1000

87. 320

88. 4

89. 240

90. 70