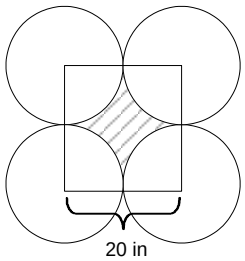
Answer Key

1. $\frac{-4}{9}$
2. -6
3. -4
4. -5.4
5. $\frac{1}{6}$
6. 0
7. -2
8. 4
9. 1.2
10. -4
11. $(8x + 5)(6x + 5)$
12. $(5x + 3)(8x - 5)$
13. $(3x + 7)(4x + 5)$
14. $5(x + 3)(4x - 5)$
15. $-(3x - 4)(4x - 5)$
16. $x^2 - 5x + 6$
17. $x^2 + 4x - 21$
18. $x^2 + x - 12$
19. $x^2 - x - 6$
20. $x^2 - 4x + 3$
21. $x^2 + 5x - 24$
22. $2x^2 + 7x + 6$
23. $12x^2 - 19x + 4$
24. $10x^2 + 17x + 3$
25. $2x^2 + x - 21$
26. $x = -1$
27. $x = -1$
28. $x = 4$
29. $10 - 2(2.5 - 3x) = 1 - 2(2x + 1.5)$
    $\Rightarrow 10 - 5 + 6x = 1 - 4x - 3$
    $\Rightarrow 5 + 6x = -4x - 2$
    $\Rightarrow 10x = -7$
    $\Rightarrow x = -0.7$
30. $10 - 0.4x + 1 = 3$
    $\Rightarrow -0.4x + 11 = 3$
    $\Rightarrow -0.4x = -8$
    $\Rightarrow x = 20$
31. D
    $2x - 4 = 2x - 4$
    $0 = 0$
    which means x can be anything.
32. $x = -3$
33. $x = -10$
34. 18/5
35. $\frac{1}{2}x + \frac{2}{3}x = 14$
    $\Rightarrow 6(\frac{1}{2}x + \frac{2}{3}x) = 6 \times 14$
    $\Rightarrow 3x + 4x = 84$
    $\Rightarrow 7x = 84$
    $\Rightarrow x = 12$
36. 0.064
37. $⅙ - \frac{1}{20} = \frac{7}{60} = 7/60$
38. 0.2
39. 192
40. 130 - 100 = 30
41. $1 + \frac{1}{1+\frac{1}{2}} = 1⅗ = \frac{5}{3}$
    $½(\frac{5}{3}) = \frac{5}{6} = 5/6$
42. $120x + 720 = 840x - 1440$
    Divide both sides by 120, then we have
    $x + 6 = 7x - 12$
    $18 = 6x$
    $x = 3$
43. $20\% = 12 \div 60 = 0.2$
44. $14 \div 1¾ = 8$
    $8 \times 25 = 200$ mi
45. $\frac{936}{52} = \frac{x}{80}$
    x = 1440
46. 5 lb 8 oz = 5½ lb
    3 lb 4 oz = 3¼ lb
    $3½ \times 4 + 2¼ \times 2 = 14 + 4.50 = 18.50$ (total)
    20 - 18.50 = $1.50 (change)
47. $½x - ⅓x = 6$
    $⅙x = 6$
    $x = 36$
48. $160 \div 4 = 40$
    $40 \div 2 = 20$
    The square below cover ¼ of each circle. The area of the shaded region is
    $20 \times 20 - 10^2 \times 3.14 = 400 - 314 = 86$



49. (1, 1), (1, 2), and (2, 1)
$\frac{3}{36} = \frac{1}{12} = 1/12$

50. $2\{½\times100\pi\} + ½\times200\pi$
$= 200\pi$
$= 628$ yards

51. $628\div4 = 157$ hours.

52. $108\div3 = 36$
$36 = 6^2$
each side = 6 cm
$2(18+6) = 48$ cm (perimeter)

53. LCM(6, 8) = 24 min
A = 20 rounds
B = 21 rounds
20 + 21 = 41 rounds

54. $½ - ⅓ = ⅙$
$8\div⅙ = 48$ (the weight of whole wine when full)
$½\times48 = 24$
68 - 24 = 44 pounds

55. $25\div2 = 12.5$
$3\div2 = 1.5$
12.5 + 1.5 = 14

56. 4×10^2
Ans = 4 & 2

57. $((3\times9)^2)^3 = 27^{\square}$
$\square = 6$

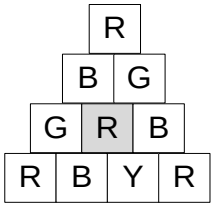
58. $3^{90} \div 3^{40} \div 3^{30} = 3^{90-40-30} = 3^{20}$
$\square = 20$

59. 2.16×10^{14}

60. $-2a + 3(3) = 5 \Rightarrow a = 2$

61. $5n^2 - 13n = 6$
$5n^2 - 13n - 6 = 0$
$(5n+2)(n-3) = 0$
$n = -0.4$ or 3

62. A



63. $(10 - 2)\times180 = 1440°$

64. $\angle ACB = 180° - 130° = 50°$
$x = 180° - 2(50°) = 80°$

65. 30+40 = 70
$30\times0.6+40\times0.25 = 28 =$ **40%**$\times70$
Ans = 40%

66. C
$\frac{3}{5} = \frac{x}{10}$
$x = 6$

67. Two triangles are similar.
The area ratio is the side ratio squared
$= (3 : 5)^2 = 9{:}25$

68. $30\times2 + 5\times2 + 4(15 - 5)$
$= 60 + 10 + 40$
$= 110$

69. Let x ounces of 3%-solution and $(85 - x)$ ounces of 19%-solution are mixed. Therefore, we have
$x(3\%) + (85 - x)(20\%) = 85(19\%)$
$3x + 20(85 - x) = 85\times19$
$-17x = -85$
$x = 5$ (oz)

70. D
$\frac{2}{5} = 0.4 = 40\%$

71. E
$0.4^2 = 0.16 = 16\%$

72. 50

73. 90

74. 6 – 3 = 3
15 – 6 = 9
3:9 = 1:3
Ans = 15 (L of 3%) & 5 (L of 6%)

75. 3

76. 13