

Answer Key

1. 62

2. 5

3. -28

4. 6

5. 10

6. 63

7. -14

8. 120

9. -4

10. -5

11. 0.00014

12. 0.00005

13. 0.2

14. 1,000

15. 0.00028

16. 0.00004

17. 0.00003

18. 0.28

19. 0.00032

20. 0.018

21. $\frac{1}{4} + \frac{1}{4} = \frac{1}{2}$

22. $1 - \frac{2}{3} = \frac{1}{3}$
 $3\frac{1}{5} = 3\frac{3}{15} = 3\frac{8}{15}$
 $\frac{1}{3} + \frac{8}{15} = \frac{5}{15} + \frac{8}{15} = \frac{13}{15}$

23. $\frac{1}{12} + \frac{1}{8} = \frac{2}{24} + \frac{3}{24} = \frac{5}{24}$

24. $3\frac{21}{30} = 3\frac{26}{30} = 3\frac{13}{15}$
 $\frac{5}{30} = \frac{1}{6}$

25. $2\frac{5}{45} = 2\frac{11}{45}$
 $\frac{6}{45} = \frac{2}{15}$

26. $2\frac{7}{70} = 2\frac{41}{70}$
 $\frac{17}{35} = \frac{34}{70}$

27. $2\frac{8}{15} = 2\frac{16}{30} = 2\frac{21}{30} = 2\frac{7}{10}$
 $\frac{1}{6} + \frac{5}{30} = \frac{5}{30} + \frac{5}{30} = \frac{10}{30} = \frac{1}{3}$

28. $1\frac{15}{24} = 1\frac{19}{24}$
 $\frac{1}{6} = \frac{4}{24}$

29. $\frac{28}{60} = \frac{13}{60}$
 $\frac{15}{60} = \frac{1}{4}$

30. $10\frac{2}{48} = 10\frac{11}{48}$
 $\frac{9}{48} = \frac{3}{16}$

31. $11\frac{9}{36} = 11\frac{19}{36}$
 $\frac{10}{36} = \frac{5}{18}$

32. $\frac{21}{18} = \frac{29}{18} = 1\frac{11}{18}$
 $\frac{8}{18} = \frac{4}{9}$

33. $3\frac{1}{24} = 3\frac{3}{24} = 3\frac{1}{8}$
 $\frac{1}{8} + \frac{3}{24} = \frac{3}{24} + \frac{3}{24} = \frac{6}{24} = \frac{1}{4}$

34. $20\frac{21}{75} = 20\frac{76}{75} = 21\frac{1}{75}$
 $\frac{55}{75} = \frac{11}{15}$

35. Find the GCF(21, 35) first:

$7 \overline{)21,35}$
 3, 5
 $7 \times 3 \times 5 = 105$

$\frac{85}{105} = \frac{118}{105} = 1\frac{13}{105}$
 $\frac{33}{105} = \frac{11}{35}$

36. Find the GCF(75, 100) first:

$25 \overline{)75,100}$
 3, 4
 $25 \times 3 \times 4 = 300$

$\frac{148}{300} = \frac{361}{300} = 1\frac{61}{105}$
 $\frac{213}{300} = \frac{71}{100}$

37. 17

38. 56

39. 30

40. $\frac{12}{16} = \frac{7}{16}$
 $\frac{5}{16} = \frac{5}{16}$

41. $\frac{1}{2} + \frac{3}{4} = 1\frac{1}{4}$

42. $39 \div 3 = 13$

$13 \times 0.5 = \$6.50$

43. $125 - 89.85 = 35.15$

44. $100 \times 1 = 100$
 $100 + 1 = 101$ (the largest possible product)

45. $50 \times 5\% = 50 \times 0.05 = \2.50

46. The least common multiple of 2, 3 and 4 is 12. Thus, the second time they will all show up is 12 days later, which is Saturday.

47. $30 \times 80\% = 30 \times 0.8 = \24

48. $40 \times 85\% = \$34$

49. $45 \times 70\% = \$31.50$

50. $60 \times 75\% = 60 \times \frac{3}{4} = \45

51. $1\frac{1}{4} - \frac{1}{2} = \frac{3}{4}$

52. $12 \times 3 = 36$

$18 \div 36 = \$0.50 = 50$ cts

53. $\frac{4}{5} \times 90 + \frac{3}{4} \times 84 = 72 + 63 = 135$

54. $15 \times 24 = 30 \times 12 = 360$ mi

55. $80 \times 0.25 = 20$

$20 \times 20 = \$400$

56. $\frac{1}{2} \times 20 \times 10 = 100$

57. Tammy is winning. See the following table.

	Sammy	Tammy
Day 1	100	50
Day 2	100	100
Day 3	100	150
Day 4	100	200
Day 5	100	250
Day 6	100	300
Total	600	1050

58. Owen = 10

Steve = $\frac{1}{2} \times 10 = 5$

Lyndon = $3 \times 5 + 2 = 17$

59. parakeet = 4

canary = 2

goldfish = 2

turtle = 5

Total = $4 + 2 + 2 + 5 = 13$

60. $19 - 3 = 16$

$16 \div 2 = 8$

61. $10 \times 3 = 30$

$30 \div 2 = 15$

$15 + 10 = 25$

62. There are 3 possible outcomes: 2H, 1H1T and 2T. Note that HT=TH.

63. 2H and 1H1T.

64. 2T.

65. $(-1)^{1 \times 2 \times 3 \times 4 \times 5} = (-1)^{120} = 1$
 [Note: $(-1)^{\text{even}} = 1$, $(-1)^{\text{odd}} = -1$]

66. $70\%(120) = 84$

or

$84 \div 0.7 = 120$

67. $30\% \times 120 = 36$

68. $72 \times \frac{5}{6} = 60$

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69. $10000 \times 20\% = 2000$
 $10000 + 2000 = \boxed{12,000}$
70. $184 \div 8 = 23$ (miles)
71. $105 = 3 \times 5 \times 7$
 $5 \times 7 = \boxed{35}$
72. D: $36 \div \frac{4}{5} = 36 \times \frac{5}{4} = 45$
G: $45 \div \frac{3}{4} = 45 \times \frac{4}{3} = \boxed{60}$
73. 15
74. $\frac{18}{8} = \frac{9}{4} = \frac{81}{x}$
 $x = 36$
75. $150/200 = \frac{3}{4} = 0.75 = 75\%$
76. $\frac{1}{4} = 0.25 = 25\%$
77. $128 \div 16 = 8$ pints a gallon
 $576 \div 8 = \boxed{72}$ gal
78. $1 + 20\% = 1.2$
 $3,000 \times 1.2 = 3,600$
79. $5000 \times 1.2 = 6000$
or
 $6000 \div 1.2 = 5000$
80. $\text{GCD}(54, 36) = 18$
 $\text{GCD}(18, 24) = 6$
81. $1500 - 180 \times 5 = \boxed{\$600}$

Answer Key

$$1. \begin{array}{r} \frac{21}{35} - \frac{11}{35} \\ - \frac{10}{35} \\ \hline \end{array}$$

$$2. \begin{array}{r} 1\frac{3}{25} - \frac{8}{25} \\ - \frac{20}{25} \\ \hline \end{array}$$

$$3. \begin{array}{r} \frac{21}{30} - \frac{26}{30} = \frac{13}{15} \\ + \frac{5}{30} \\ \hline \end{array}$$

$$4. \begin{array}{r} \frac{20}{30} - \frac{15}{30} = \frac{1}{2} \\ - \frac{5}{30} \\ \hline \end{array}$$

$$5. \begin{array}{r} 3\frac{8}{12} = 104\frac{1}{12} \\ + 100\frac{5}{12} \\ \hline \end{array}$$

$$6. \begin{array}{r} \frac{12}{5} - \frac{17}{16} = 1\frac{1}{16} \\ + \frac{16}{16} \\ \hline \end{array}$$

$$7. \begin{array}{r} \frac{20}{30} - \frac{23}{30} \\ + \frac{3}{30} \\ \hline \end{array}$$

$$8. \begin{array}{r} \frac{10}{12} - \frac{19}{12} = 1\frac{7}{12} \\ + \frac{9}{12} \\ \hline \end{array}$$

$$9. \begin{array}{r} \frac{21}{30} - \frac{16}{30} = \frac{8}{15} \\ - \frac{5}{30} \\ \hline \end{array}$$

$$10. \begin{array}{r} \frac{15}{24} - \frac{7}{24} \\ - \frac{8}{24} \\ \hline \end{array}$$

$$11. \begin{array}{r} \frac{9}{24} - \frac{5}{24} \\ - \frac{4}{24} \\ \hline \end{array}$$

$$12. \begin{array}{r} \frac{9}{12} - \frac{11}{12} \\ + \frac{2}{12} \\ \hline \end{array}$$

$$13. \begin{array}{r} \frac{9}{15} - \frac{4}{15} \\ - \frac{5}{15} \\ \hline \end{array}$$

$$14. \begin{array}{r} \frac{9}{24} - \frac{13}{24} \\ + \frac{4}{24} \\ \hline \end{array}$$

$$15. \begin{array}{r} \frac{54}{60} - \frac{4}{60} = \frac{1}{15} \\ - \frac{50}{60} \\ \hline \end{array}$$

$$16. \begin{array}{r} 10\frac{14}{24} - 10\frac{5}{24} \\ - \frac{9}{24} \\ \hline \end{array}$$

$$17. \begin{array}{r} \frac{16}{30} - \frac{11}{30} \\ - \frac{5}{30} \\ \hline \end{array}$$

$$18. \begin{array}{r} 200\frac{7}{20} = 199\frac{19}{20} \\ - \frac{8}{20} \\ \hline \end{array}$$

$$19. \begin{array}{r} 2\frac{21}{48} - 1\frac{25}{48} \\ - \frac{44}{48} \\ \hline \end{array}$$

$$20. 14$$

$$21. \begin{array}{r} \frac{1}{4} - \frac{1}{2} \\ + \frac{1}{4} \\ \hline \end{array}$$

$$22. 1 - \frac{2}{3} = \frac{1}{3}$$

$$\begin{array}{r} 3\frac{1}{5} = 3\frac{3}{15} = 3\frac{8}{15} \\ + \frac{1}{3} + \frac{4}{15} \\ \hline \end{array}$$

$$23. \begin{array}{r} 1\frac{7}{12} = 1\frac{14}{24} = 1\frac{17}{24} \\ + \frac{1}{8} + \frac{3}{24} \\ \hline \end{array}$$

$$24. \begin{array}{r} 3\frac{21}{30} = 3\frac{26}{30} = 3\frac{13}{15} \\ + \frac{5}{30} \\ \hline \end{array}$$

$$25. \begin{array}{r} 2\frac{5}{45} = 2\frac{11}{45} \\ + \frac{6}{45} \\ \hline \end{array}$$

$$26. \begin{array}{r} 2\frac{7}{70} = 2\frac{41}{70} \\ + \frac{17}{35} - \frac{34}{70} \\ \hline \end{array}$$

$$27. \begin{array}{r} 2\frac{8}{15} = 2\frac{16}{30} = 2\frac{21}{30} = 2\frac{7}{10} \\ + \frac{1}{6} + \frac{5}{30} \\ \hline \end{array}$$

$$28. \begin{array}{r} \frac{1}{24} - \frac{1}{24} = \frac{13}{24} \\ + \frac{1}{6} - \frac{4}{24} \\ \hline \end{array}$$

$$29. \begin{array}{r} \frac{28}{60} - \frac{13}{60} \\ - \frac{15}{60} \\ \hline \end{array}$$

$$30. \begin{array}{r} 10\frac{2}{48} = 10\frac{11}{48} \\ + \frac{9}{48} \\ \hline \end{array}$$

$$31. \begin{array}{r} 11\frac{9}{36} = 11\frac{19}{36} \\ + \frac{10}{36} \\ \hline \end{array}$$

$$32. \begin{array}{r} \frac{21}{18} - \frac{29}{18} = 1\frac{11}{18} \\ + \frac{1}{18} \\ \hline \end{array}$$

$$33. \begin{array}{r} 3\frac{1}{24} = 3\frac{1}{24} = 3\frac{1}{6} \\ + \frac{1}{8} + \frac{3}{24} \\ \hline \end{array}$$

$$34. \begin{array}{r} 20\frac{21}{75} = 20\frac{76}{75} = 21\frac{1}{75} \\ + \frac{7}{75} \\ \hline \end{array}$$

$$35. \text{ Find the LCM}(21, 35) \text{ first:}$$

$$\begin{array}{r} 7 \overline{)21,35} \\ \underline{3, 5} \\ 7 \times 3 \times 5 = 105 \end{array}$$

$$\begin{array}{r} \frac{85}{105} - \frac{118}{105} = 1\frac{13}{105} \\ + \frac{33}{105} \\ \hline \end{array}$$

$$36. \text{ Find the LCM}(75, 100) \text{ first:}$$

$$\begin{array}{r} 25 \overline{)75,100} \\ \underline{3, 4} \\ 25 \times 3 \times 4 = 300 \end{array}$$

$$\begin{array}{r} \frac{148}{300} - \frac{361}{300} = 1\frac{61}{300} \\ + \frac{213}{300} \\ \hline \end{array}$$

$$37. 17$$

$$38. 56$$

$$39. 30$$

$$40. \begin{array}{r} \frac{12}{16} - \frac{7}{16} \\ - \frac{5}{16} \\ \hline \end{array}$$

$$41. \frac{1}{2} + \frac{3}{4} = 1\frac{1}{4}$$

$$42. 3 + 11 = 14$$

$$43. 3 \times 11 = 33$$

$$44. \frac{1}{2}(3 + 11) = 7$$

45. No
Dan will be 4 and Eric will be 12, $12 \div 4 = 3$.

$$46. 2 \text{ lb } 8 \text{ oz} = 40 \text{ oz}$$

$$6.40 \div 40 = \$0.16$$

$$47. 120 \div 2 = 60$$

$10 \div 2 = 5$
 $60 + 5 = 65$ (cook books)
 $60 - 5 = 55$ (gardening books)

$$48. 1.5 \times 16 = 24$$

$$24 \div 2 = \boxed{12}$$

$$49. \frac{4}{5}$$

$$50. 5 \times 40 + 11 \times 20 + 8 \times 15 - 150$$

$$= 200 + 220 + 120 - 150$$

$$= \$390$$

51. By 2:30 pm ($90 \div 60 = 1.5$ hours = 1 hr 30 min)

$$52. 90 \times 2 \div 20 = 9 \text{ gal}$$

$$53. 2 + 6 + 18 + 54 + 162 = \boxed{242}$$

subscribers

$$54. 1705 - 1252 = 453$$

$$55. 36.75 - 35 = 1.75$$

$$1.75 \div 35 = 0.05 = \boxed{5\%}$$

56. $\frac{5}{6} = \frac{35}{42}$ (Archer A)
 $\frac{6}{7} = \frac{36}{42}$ (Archer B, slightly better)

$$57. 8.95 \times 4 = 35.80$$

$$20 \times 3 - 35.80 = 24.20$$

$$58. 4 \times 1.25 + 4.5 = \$9.50$$

$$59. 20/24 = \frac{5}{6}$$

60. 1 gallon = 8 quarts
 $1\frac{1}{2} \times 8 = 12$

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- $7.5 \div 12 = 2.5 \div 4 = 0.625 = 62.5\%$
 61. $7 \div 0.50 = 14$ days
 62. $15 \times 20 = 300$
 $300 \div (15 - 3) = 25$ days
 63. $24\frac{1}{2} - 12\frac{5}{8} = 11\frac{7}{8}$
 $4 \times 11\frac{7}{8} = 44\frac{7}{2} = \boxed{\$47.50}$
 64. $\frac{1}{3} \times 18 = 6$
 65. $18 \div \frac{3}{4} = 24$ or $18 + 6 = 24$
 66. B
 $2 \times 2 = 4$
 $3 \times 4 + 2 = 14$
 $4 \times 14 = 56$
 67. $\frac{3}{8}$
 68. $0.6 \div 4 = 0.15$
 $0.15 \times 50 = \$7.50$
 69. $33 \times 0.15 = \$4.95$
 33 minutes are the maximum.
 70. $91 \div 35 = \frac{91}{35} = \frac{13}{5} = 2.6$
 hours = 2 hr 36 min
 71. $\frac{5000 - 4000}{5000} = 0.2 = 20\%$
72. $27 \div 3 = 9$
 8, 9, 10
 $8 \times 9 \times 10 = \boxed{720}$
 73. $\frac{3}{2}$ or $1\frac{1}{2}$
 74. $1yx9 \div 9 = 1xy1$
 or
 $9xy1 \div 9 = 1yx9$
 What is the quotient in the long division of $9xy1 \div 9$?
 If $x = 9$, then $y = 1$, but 9911 is not divisible by 9.
 Therefore, $x \neq 9$, thus the quotient of $9xy1 \div 9$ must be $10y9$. To be divisible by 9,
 $1+0+y+9$ must be divisible by 9, so $y = 8$.
 Therefore, The original number is 1089.
 75. $\frac{35}{5} \times 8 = 7 \times 8 = \56.00
 76. 30
 77. The LCM of 2 and 3 is 6, which means they will meet each other every 6 days. So, the earliest day they are
- going to meet is next Monday.
 78. $\frac{1}{2} \times 12 \times 12 = 72$
 $72 \div 4 = 18$
 $18 \times 6 = \boxed{108 \text{ plants}}$
 79. Saturday
 She can buy ice cream every 12 days.
 3, 6, 9, 12, 15, 18, 21, 24
 4, 8, 12, 16, 20, 24
 The next time she can buy it will be 12 days later, which is a Saturday.
 80. $30 \times \frac{1400}{8}$
 $= 30 \times 14 \times 125$
 $= 15 \times 7 \times (2 \times 2 \times 125)$
 $= 15 \times 7 \times 500$
 $= 105 \times 500$
 $= \boxed{52,500 \text{ pounds}}$
 81. Mon: 3
 Tue: 6
 Wed: 12
 Thu: 24
 Fri: 48 cards

Answer Key

- $60 \div 3 = 20$
 $8 \div 4 = 2$
 $20 \times 2 = \boxed{40 \text{ tiles}}$
- $1.50 \times 2 = \$3$
- $3 \times 3 = \$9$
- $2 \times 1.5 = 3$
 $3 - 1 = \$2.00$
- (a) $2 \div 2 = 1$
 $1.5 - 1 = \$0.50$ (pencil)
(b) $1.5 + 1 = \$2.50$ (eraser)
- $395 \times 6 = (400 - 5) \times 6 = 2400 - 30 = 2370$
- C
Note that for two "different whole numbers < 10 ," the only answer is
 $9 \times 8 = 72$.
- $91 = 7 \times 13$
 $7 + 13 = 20$
- $49 - 21 = 28$
 $28 \div 2 = \boxed{14}$
- $69 - 20 = 49$
 $49 = 7 \times \boxed{7}$
- $22 \times 3 = 66$
 $66 \div 2 = \boxed{33}$
- 9 jumbo cars
Let's assume all of the cars are Jumbo, the total number of seats should be
 $6 \times 24 = 144$
However, the actual number of seats is 114, a shortage of 30 seats. Why? Because there are too many Jumbo cars in our assumption. Since each Tiny car seat 2 less passengers than Jumbo, there must be
 $30 \div 2 = 15$ tiny cars.
Therefore, there are 9 Jumbo cars. Let's double-check.
 $15 \times 4 + 9 \times 6 = 60 + 54 = 114$
- 255 curl-ups
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,
1st day: 1,
2nd day: 3 ($2 \times 1 + 1$),
3rd day: 7 ($2 \times 3 + 1$),
4th day: 15 ($2 \times 7 + 1$),
5th day: 31 ($2 \times 15 + 1$),
6th day: 63 ($2 \times 31 + 1$),
7th day: 127 ($2 \times 63 + 1$),
8th day: 255 ($2 \times 127 + 1$)
14. 9 cats; 18 crows

First, let's observe one thing: A crow has two legs, while a cat has four.
Two crows have 4 legs, same as a cat does.

Since there are twice as many crows as there are cats, let's make 2 crows and a cow into a group.
Each group has 8 legs and 3 heads, or 11 legs and heads.

$$99 \div 11 = 9 \text{ (groups)}$$

Among 9 such groups (each with 2 crows and 1 cat), there are 9 cats and 18 crows.

- $480 \div 40 = 12$
- $12 \times 1.5 = 18$
 $10 \times 18 = 180$
 $480 + 180 = \boxed{\$660}$
- $15 \times 9 + 20 \times 12 = 135 + 240 = \375
- $1.25 \times 2 \times 12 = 2.5 \times 12 = 5 \times 6 = \30
- $75 \div 25 = 3$ points each problem
 $20 \times 3 = 60$ points
- $\frac{90}{60} = 1\frac{30}{60} = 1\frac{1}{2}$
- $\frac{15}{84} = \frac{5}{28}$

$$22. \begin{array}{r} \frac{16}{180} \\ + \frac{21}{180} \\ \hline \frac{37}{180} \end{array}$$

$$23. \begin{array}{r} \frac{49}{168} \\ - \frac{20}{168} \\ \hline \frac{29}{168} \end{array}$$

$$24. \begin{array}{r} \frac{28}{175} \\ - \frac{15}{175} \\ \hline \frac{13}{175} \end{array}$$

$$25. \begin{array}{r} \frac{33}{54} \\ + \frac{28}{54} \\ \hline \frac{61}{54} = 1\frac{7}{54} \end{array}$$

$$26. \begin{array}{r} \frac{35}{300} \\ - \frac{18}{300} \\ \hline \frac{17}{300} \end{array}$$

$$27. \begin{array}{r} \frac{3}{24} \\ + \frac{12}{24} \\ \hline \frac{15}{24} = \frac{5}{8} \end{array}$$

$$28. \frac{15+10+12}{30} = 1\frac{7}{30}$$

$$29. \frac{15+24}{40} = \frac{39}{40}$$

$$30. 6 + \left(\frac{1}{2} + \frac{2}{3} + \frac{1}{4}\right) = 6 + \frac{6+8+3}{12} = 7\frac{5}{12}$$

31. 14

32. 48

33. 85

34. 51

35. 36

36. $\frac{2}{5}$

37. $\frac{45}{2} = 22\frac{1}{2}$

38. 45

39. $\frac{21}{5} = 4.2$

40. 170

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. $4\frac{2}{3}$

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53. $\frac{9}{5} \div \frac{27}{10} = \frac{9}{5} \times \frac{10}{27} = \frac{2}{3}$
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. $\frac{\frac{13}{39}}{\frac{10}{9}} = \frac{10}{9} = 1\frac{1}{9}$
57. $\frac{20}{49}$
58. $1\frac{3}{4} \times 5 \times 2 = \frac{35}{4} \times 2 = 17\frac{1}{2}$ hours
59. $2\frac{5}{6} \div 2 = 3\frac{5}{12}$
60. $\frac{2}{3} \times \frac{1}{4} = \frac{1}{6}$
61. $60 \times (1 - 0.3) = 60 \times 0.7 = \boxed{\$42}$
62. D
63. C
64. $3 \times 5 = 15$ mi
65. $16\frac{1}{8} - 1\frac{3}{4} = 14\frac{3}{8}$
 $14\frac{3}{8} \div 7 = 2\frac{3}{56}$
66. Method I)
 Let x be the number of students.
 $4x + 10 = 5(x - 2) - 10$
 $4x + 10 = 5x - 20$
 $x = \boxed{30}$
 Method II)
 $2 \times 4 + 10 = 18$ (leftover books if 2 students take none)
 $18 \times (5 - 4) + 10 = 28$
 (number of students who take 5 books)
 $28 + 2 = 30$ (total number of students)
67. $2 \times 20 = 40$ ft per minute
 1000 yd = 3000 ft
 $3000 \div 40 = 75$ min = $\boxed{1\frac{1}{4}}$ hr
68. 12 days since the least common multiple of 4 and 6 is 12.
69. $T = D/S = 300/50 = 6$ (hr)
70. $191 \times 2 + 1 = 382 + 1 = 383$
71. .00005
72. $\frac{180}{45} \times (4 + 3.5) = \boxed{30}$ hrs
73. $5 \times 4 = \boxed{20}$ words.
 Note that the order does matter in this problem. The first set has 10 words: AB, AC, AD, AE, BC, BD, BE, CD, CE, DE.
 The second set also has 10 words: BA, CA, DA, EA, CB, DB, EB, DC, EC, and, ED. (Each word in the second set is nothing but the reverse of a word from the first set.)
74. Let AB mean that Alex is the chair and Ben is the vice-chair. There are 20 possible outcomes.
75. The order does not matter in this problem. So, the outcomes are AB, AC, AD, AE, BC, BD, BE, CD, CE, and DE.
76. 10 matches
 The order does not matter. There are 10 matches needed: RY, RG, RB, RW, YG, YB, YW, GB, GW, and BW.
77. 12 outcomes
 Let us use W, B, G, and R to represent the four students: Wei, Bob, Gary, and Rob. A pair "WB" means Wei is the president and Bob is the treasurer. There are 12 possible pairs
 WB, WG, WR,
 BG, BR,
 GR.
 and
 BW, GW, RW,
 GB, RB,
 RG.
78. 16 outcomes
 There are 4 additional cases to the previous answer.
 WW,
 BB,
 GG,
 RR.
79. $\frac{7}{16}$
80. $15 \div (3^2 - 2^2) = 3$
 $5 + 3 = 8$
 $8 \div 2 = \boxed{4}$

Answer Key

- $17 \div 25 = 0.68 = \boxed{68\%}$
- $\frac{18}{24} = \frac{3}{4} = 75\%$
- $0.03 \div 0.05 = \boxed{60\%}$
- $\frac{30}{120} = \frac{1}{4} = 25\%$
- $10 + 25 + 15 = 50$
 $35 \div 50 = \boxed{70\%}$
- $\frac{2}{5} = 0.4 = 40\%$
- $0.4^2 = 0.16 = 16\%$
- $1 - 24\% - 13\% - 41\% = \boxed{22\%}$
- $30 + 40 = 70$
 $30 \times 60\% + 40 \times 25\% = 28$
 $\frac{28}{70} = \boxed{40\%}$
- 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%.
- $\frac{8}{15}$
- $\frac{8}{15}$
- $\frac{16}{35}$
- $\frac{8}{21}$
- $\frac{4}{9}$
- $\frac{3^1}{40^2} \times \frac{5^1}{12^4} = \frac{1}{8}$
- $\frac{9^1}{20^2} \times \frac{10^1}{27^3} = \frac{1}{6}$
- $\frac{2}{25^5} \times \frac{5}{8^4} = \frac{1}{20}$
- $\frac{4}{3} = 1\frac{1}{3}$
- $\frac{5}{12}$
- 14
- $160 + 6 = 166$
- 1
- $\frac{2}{5}$
- $\frac{1}{2}$
- $\frac{1}{10}$
- $\frac{6}{2} = 3$
- $\frac{1}{25}$
- $\frac{4}{3} = 1\frac{1}{3}$
- $\sqrt{\frac{49}{9}} = \frac{7}{3}$

- $20 \times \frac{1}{2} = 10$
- $21 + 3 = 24$ (Quin)
 $\frac{1}{3} \times 24 = 8$ (Rachel)
- $1016 \div 2 = 508$ (one hot dog)
 $508 \div 2 \times 2 = 508$ (two hot dogs)
 $508 + 508 = \boxed{1016}$
- $48 \times 6 = 288$ oz
- $288 \div 32 = 9$ qt
- \$4.00
- \$12.00
- \$6.00
- \$18.00
- \$27.00

See the following transaction record.

	the share taken	leftover	total before taken
Candy	\$4	\$8	\$12
Brenda	\$6	\$12	\$18
Alice	\$9	\$18	\$27

- Let's reverse the game by asking to return the money that some lost.
- Let's reverse the game by asking to return the money that some lost.

	After 3 rd game	Reversed transaction	Before 3 rd game
Alex	12	-6	6
Ben	12	-6	6
Carl	36	+12	48

Alex had \$6, Ben had \$6, and Carl had \$48 before the 3rd game.

	After 2 nd game	Reversed transaction	Before 2 nd game
Alex	6	-3	3
Ben	6	+27	33
Carl	48	-24	24

Alex had \$3, Ben had \$33, and Carl had \$24 before the 2nd game.

- Each gallon cost her
 $9.30 \div 3 = 3.1$
Since she used $\frac{1}{2}$ gallon to paint 5 rooms, each room use $\frac{1}{10}$ of a gallon, so the cost for each room is
 $\frac{1}{10}(3.10) = \$0.31$
- $3 \times 9 = 27$
- $2 \div 5 = 0.4$ min (each block)
 $0.4 \times 8 = 3.2$ minutes = 3 minutes 12 seconds
- $12345 \times 11 = \$135,795$
- $2,940 \div 7 = 420$
- $180 \div 2 = 90$
 $10 \div 2 = 5$
 $90 + 5 = 95$ (Larry)
 $90 - 5 = 85$ (Wilson)
- $50 \div 2 = 25$
 $5 \div 2 = 2.5$
 $25 + 2.5 = \$27.50$ (Alex)
 $25 - 2.5 = \$22.50$ (Brian)
- No Since it took him $1\frac{1}{2} + \frac{1}{2} + 1\frac{3}{4} = 3\frac{3}{4}$ hours, or 3 hours and 45 min. If he started at 6 o'clock, he would complete it at 9:45.
- $300 - 60 = 240$
 $240 \div 5 = \$48.00$
- $10/80 = \frac{1}{8} = 0.125 = 12.5\%$
- $32.5 \times (17 + 13) = 32.5 \times 30 = 325 \times 3 = 975$
- $144\pi = 12^2\pi$
 $2 \times 12\pi = 24\pi$ inches
- $25 - 4 = 21$
 $21 \div 25 = 84\%$
- 12 for \$2
6 for \$1
18 for \$3
 $18 - 12 = \boxed{6}$ oranges added
- $120:144 = 10:12 = 5:6$
- $30 \div 5\% = 30 \div 0.05 = 3000 \div 5 = \600
- $8 + 9 + 4 = 21$
See the steps below.



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$$21 - (9 + 5) = 7$$

8		
9	7	5
4	n	

$$21 - (4 + 7) = 10$$

8		10
9	7	5
4	n	

$$21 - (8 + 10) = 3$$

8	3	10
9	7	5
4	n	

$$21 - (3 + 7) = 11$$

8	3	10
9	7	5
4	11	

60. The least common multiple of 6 and 10 is 30.
The least common multiple of 30 and 8 is 120.

61. E
62. $2(80 + 60) = 280$
 $280 \div 10 = 28$ posts
63. For A: $12 \div 20 = 0.6$
For B: $18 \div 30 = 0.6$
Thus, both have the same steepness.

64. $25\% \times \$600 = \150
65. $600 + 150 = \$750.00$
66. The order does not matter.
There are 10 matches needed: RY, RG, RB, RW, YG, YB, YW, GB, GW, and BW.

67. ① $9+8+7+6+5+4+3+2+1 = 99$, 7 addition signs.
② $9+8+7+6+5+4+3+2+1 = 99$, 6 addition signs.

68. $Y = \boxed{-1}$

1		Y = -1
-4	-2	
-3		-5

69. $125 = 5^3$
 $5^2 = 25 \text{ cm}^2$
70. (a) $\frac{8}{15}$
(b) $\frac{8}{15} \times 300 = 160$