D. **Factoring**:

If a number is the product of two (or more) integers, then the integers are factors of the number.

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example: $40 = 4 \times 10, \ 2 \times 20, \ 1 \times 40$, and 8×5.
So 1, 2, 4, 5, 8, 10, 20, 40 are all factors of 40.
   (So are all their negatives.)

Problems 82-86: Find all positive factors of:

82. 10	83. 7	84. 24	85. 9	86. 1

If a positive integer has exactly two positive factors, it is a <u>prime number</u>. Prime numbers are used to find the <u>greatest common factor (GCF)</u> and <u>least common multiple (LCM)</u>, which are used to reduce fractions and find common denominators, which in turn are often needed for adding and subtracting fractions.

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example: The only positive factors of 7 are 1 and
   7, so 7 is a prime number.

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example: 6 is not prime, as it has 4 positive
   factors: 1, 2, 3, 6.

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87. From the prime number definition, why is 1
   not a prime?

88. Write the 25 prime numbers from 1 to 100.

Every positive integer has one way it can be factored into primes, called its <u>prime factorization</u>.

Answers

82. 1, 2, 5, 10
83. 1, 7
84. 1, 2, 3, 4, 6, 8, 12, 24
85. 1, 3, 9
86. 1
87. 1 has one factor
88. 2, 3, 5, 7, 11, 13, 17, 19,
    23, 29, 31, 37, 41, 43, 47,
    53, 59, 61, 67, 71, 73, 79,
    83, 89, 97

example: Find the prime factorization (PF) of 30:
$30 = 3 \times 10 = 3 \times 2 \times 5$, so the PF of 30 is $2 \bullet 3 \bullet 5$.

example: $72 = 2 \bullet 2 \bullet 2 \bullet 3 \bullet 3 = 2^3 \bullet 3^2$, the PF. (The PF can be found by making a "factor tree.")

Problems 89-91: Find the PF:

89. 36

90. 10

91. 7

Greatest common factor (GCF) and least common multiple (LCM).

Problems 92-95: Find the GCF and the LCM of:

92. 4 and 6

93. 4 and 7

94. 4 and 8

95. 3 and 5

Answers

89. $2^2 \cdot 3^2$
90. $2 \cdot 5$
91. 7
92. 2, 12
93. 1, 28
94. 4, 8
95. 1, 15

E. <u>Word problems</u>:

96. The temperature goes from $-14°$ to $28°C$.
How many degrees Celsius does it change?

97. $28 - (-14) =$

98. Derek owes \$43, has \$95, so "is worth"…?

99. If you hike in Death Valley from 282 feet
below sea level to 1000 feet above sea level,
how many feet of elevation have you gained?

100. $1000 - (-282) =$

101. A hike from 243 feet below sea level
(FBSL) to 85 FBSL means a gain in elevation
of how many feet?

102. $-85 - (-243) =$

103. What number added to -14 gives -24?

Answers

96. 42
97. 42
98. $52
99. 1282
100. 1282
101. 158
102. 158
103. −10

E. Word problems:

104. What does "an integral number" mean?

105. Jim wrote a check for $318. His balance is then $2126. What was the balance before he wrote the check?

106. What number multiplied by 6 gives −18?

107. If you hike downhill and lose 1700 feet of elevation and end at 3985 feet above sea level (FASL), what was your starting elevation?

108. Anne was 38 miles south of her home. She drove 56 miles north. How far from home was she at that time and in what direction?

109. 5 subtracted from what number gives −12?

110. What number minus negative four gives ten?

Answers

104. an integer
105. $2444
106. –3
107. 5685 FASL
108. 18 mi. N
109. –7
110. 6