

### Solutions for Rumack's Preparation Workbook: 1.3

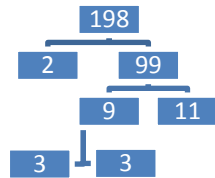
1. To find out which answer is not a factor, divide each into 204 and see if there is a remainder. The answer is (D) because 8 divides into 204 with a remainder of 4, so 8 is not a factor. You can also use divisibility rules. Since the hundreds digit is even and the remaining digits do not form a multiple of 8, 8 is not a factor. Another way to solve this question is to list all the factors of 204, but since 204 is a large number, this will take longer.

2. Since 4 is not a prime number, it cannot be a prime factor of any number. The answer is (E) None of the above.

3. To find out which number has 8 and 9 as factors, use divisibility rules. The answer is (A). 216 is divisible by 9, as the sum of the 3 digits is 9, and it is also divisible by 8 since the hundreds digit is even and 16 is divisible by 8.

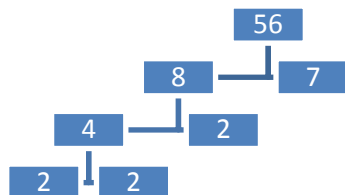
4. To find the greatest common factor, list all factor pairs of each number and then circle the factors that are common in both lists. The factor pairs of 256 are 1 x 256, 2 x 128, 4 x 64, 8 x 32 and 16 x 16. The factor pairs of 144 are 1 x 144, 2 x 72, 3 x 48, 4 x 36, 6 x 24, 8 x 18, 9 x 16 and 12 x 12. The common factors are 1, 2, 4, 8 and 16. The answer is (B) 16.

5. To find the prime factors of 198, create a factor tree. The answer is not (A) or (C) because they are not prime factors. The answer is (B) 11 and 3.



6. To find which is not a multiple of 8, list multiples of 8 up to 104 and circle the ones that are answer choices. Multiples of 8: 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96, 104. The answer is (D) because 78 is missing from the list of multiples of 8.

7. To find the greatest prime factor, use a factor tree. The answer is (D) 7.



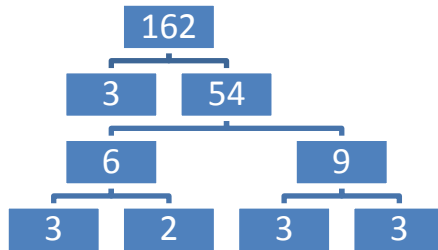
8. To find the lowest common multiple, list multiples of 6 and 8 and circle first one that appears in both sets. Multiples of 6: {6, 12, 18, 24, 30, 36, ...}. Multiples of 8: {8, 16, 24, 32, ... }. The answer is (E) 24 since it is the lowest common multiple.

9. To find the greatest common factor, list factors of each number and circle factors that are common to both numbers. Factor pairs of 36:  $1 \times 36, 2 \times 18, 3 \times 12, 4 \times 9, 6 \times 6$ . Factors pairs of 144:  $1 \times 144, 2 \times 72, 3 \times 48, 4 \times 36, 6 \times 24, 8 \times 18, 12 \times 12$ . The greatest common factor is 36. The answer is (E) 36.
10. To find which is not a factor of 132, list all factors and circle the ones that are answer choices. Factor pairs of 132:  $1 \times 132, 2 \times 66, 3 \times 44, 4 \times 33, 6 \times 22, 11 \times 12$ . The missing answer choice is 8. Another way would be to divide 132 by each choice and see if there is a remainder. The answer is (C) 8.
11. To find which answer is not a factor, list all factors and circle the answer choices in this list. The factor pairs of 231:  $1 \times 231, 3 \times 77, 11 \times 21$ . Another way would be to divide 231 by each choice and see if there is a remainder. The answer is (A) 31.
12. To find out which is not a perfect square, find the square root of each answer choice. If you know  $12 \times 12$  is 144, increase the square root by small intervals to determine other square numbers ( $13 \times 13 = 169, 15 \times 15 = 225$ , etc.) The answer is (B)  $\sqrt{342}$ , since  $\sqrt{400} = 20$ , and  $\sqrt{361} = 19$ .
13. To find the sum of the prime factors, find the prime factors using a factor tree, and then add. The prime factors are 5 and 7.  $5 + 7 = 12$ . The answer is (C).
14. To find the difference, subtract the smallest factor from the largest factor. The largest factor of 144 is 144 because the largest factor of any number is always itself. The smallest factor of 144 is 1 because the smallest factor of any number is always 1. The answer is (B), since the difference is 143.
15. To find the lowest common multiple, list multiples of 15 and 25 and circle the one that appears first in both sets. Multiples of 15: {15, 30, 45, 60, 75, 90, 105, ...}. Multiples of 25: {25, 50, 75, 100, 125, ...}. The answer is (C) 75.
16. To find the difference between the most similar factor pair, find all factor pairs and then subtract. Factor pairs of 64:  $1 \times 64, 2 \times 32, 4 \times 16, 8 \times 8$ .  $8 - 8 = 0$ , so the answer is (E).
17. To find out which answer choice does not have 2, 3, and 4 as factors, use divisibility rules. The answer is (D). 140 is divisible by 2 because it is even and divisible by 4 since  $140 \div 4 = 35$ . However, it is not divisible by 3 because the sum of the digits is not a multiple of 3.
18. To find out which pair of numbers is not a factor pair, multiply each and compare with 72. The answer is (C), since  $4 \times 19 = 76$ .
19. To find the smallest prime factor of 100, determine if each answer choice is prime and a factor of 100. 2 and 5 are both prime factors of 100, and 2 is the smallest. The answer is (B).
20. To find the greatest factor of 72 that is not a multiple of 2, list all factors, eliminate multiples of 2, and choose the greatest remaining factor. Factor pairs of 72:  $1 \times 72, 2 \times 36, 3 \times 24, 4 \times 18, 6 \times 12, 8 \times 9$ . The odd factors of 72 are 1, 3 and 9. The greatest of these is 9. The answer is (D).

21. To find the sum, list all factors of 105 and then add the odd ones. Factor pairs:  $1 \times 105$ ,  $3 \times 35$ ,  $5 \times 21$ ,  $7 \times 15$ . The sum of the odd factors is  $1 + 3 + 5 + 7 + 15 + 21 + 35 + 105 = 192$ . The answer is (A).

22. To find the sum, list all factors of 36 and then add the even factors. Factor pairs:  $1 \times 36$ ,  $2 \times 18$ ,  $3 \times 12$ ,  $4 \times 9$ ,  $6 \times 6$ . The sum of the even factors is  $2 + 4 + 6 + 12 + 18 + 36 = 78$ . The answer is (A).

23. To find the prime factors of 162, draw a factor tree. The answer is (E) 2, 3.



24. To find the sum, find all factors of 60 and add. Factor pairs of 60:  $1 \times 60$ ,  $2 \times 30$ ,  $3 \times 20$ ,  $4 \times 15$ ,  $5 \times 12$ ,  $6 \times 10$ . The sum of all the factors is  $1 + 2 + 3 + 4 + 5 + 6 + 10 + 12 + 15 + 20 + 30 + 60 = 168$ . The answer is (A).

25. To find the lowest common multiple, list multiples of 14 and 35 and circle the ones that appear in both sets. Multiples of 14: {14, 28, 42, 56, 70, 84, 98, ...}. Multiples of 35: {35, 70, 105, 140, ...}. The answer is (A) 70.