edmentum™

Printable Worksheets
ACT & SAT Prep

Study Island®

ACT – Fraction Rates and Ratios

1. If five shirts cost $106.25, what is the cost of two shirts?
   - A. $40
   - B. $85
   - C. $10
   - D. $63.75
   - E. $42.50

2. An old laptop will run for 3.5 hours on its battery. Melina purchased a new laptop that consumes one third as much energy as the old laptop. On the same battery, for how many hours will the new laptop run?
   - A.   9.5
   - B.   6.5
   - C.   10.5
   - D.   1.5
   - E.   27.5

3. At a construction site, 20,000 pounds of gravel are needed to create a driveway with an area of 400 ft2. What area of driveway can be added with another 125 pounds of gravel?
   - A.   160 ft2
   - B.   5 ft2
   - C.   2.5 ft2
   - D.   25.5 ft2
   - E.   312 ft2

4. What number can you add to the numerator and denominator of $\frac{21}{25}$ to get $\frac{4}{5}$?
   - A.   -5
   - B.   4
   - C.   3
   - D.   -4
   - E.   5

5. What is the value of x in the following sum of fractions?
   $\frac{x}{2} + \frac{x}{3} + \frac{x}{5} + \frac{x}{6} = 6$
   - A.   1
   - B.   5
   - C.   2
   - D.   3
   - E.   4

6. What number can you subtract from the numerator and denominator of $\frac{51}{71}$ to get $\frac{2}{3}$?
   - A.   11
   - B.   17
   - C.   14
   - D.   20
   - E.   10

7. Initially, six handbags cost a total of $192. During a sale, Betty finds she can buy three handbags for $36. By what amount does the cost per bag decrease during the sale?
   - A. $12
   - B. $39
   - C. $44
   - D. $20
   - E. $32

8. Sally paid $56 for 5 shirts at one store, while Harry paid $86 for 8 shirts from a different store. Who paid a higher price per shirt, and what was that price?
   - A.   Harry, at $10.75
   - B.   Sally, at $10.75
   - C.   Harry, at $11.20
   - D.   Sally, at $10.00
   - E.   Sally, at $11.20

9. Tina and Jim live 5 miles apart from each other. Tina ran from her house to Jim's house at a rate of 10 miles per hour. Jim ran from his house to Tina's house at a rate of 8 miles per hour. How far had Jim run by the time he crossed paths with Tina?
   - A.   2 $\frac{1}{9}$ miles
   - B.   3 $\frac{2}{9}$ miles
   - C.   2 miles
   - D.   3 miles
   - E.   2 $\frac{2}{9}$ miles

10. A pound of coffee produces 25 cups of coffee when brewed. The price of coffee decreased from $14.25 per pound to $0.52 per cup. What does a pound of coffee now cost?
   - A. $13
   - B. $12.25
   - C. $13.25
   - D. $12.85
   - E. $14

Answers

1. E

2. C

3. C

4. A

5. B

6. A

7. D

8. E

9. E

10. A

Explanations

1. Since the question asks for the value of a single quantity and the answer choices involve only numbers, we can use the Start In The Middle technique.

   Start by plugging in the middle value, $42.50. If two shirts cost $42.50, one shirt must cost $21.25. Five shirts at $21.25 each comes to $106.25, which means that $42.50 is the correct answer.

2. Since the question asks for the value of a single quantity and the answer choices involve only numbers, we can use the Start In The Middle technique.

   We should start by plugging in the middle value, 9.5. Dividing 9.5 by 3 results in 3.167 hours. Since this is too low, we can eliminate 1.5 and 6.5. Dividing 10.5 by 3 results in 3.5 hours. Therefore, 10.5 is the correct answer.

3. Since the question asks for the value of a single quantity and the answer choices involve only numbers, we can use the Start In The Middle technique.

   We should start by plugging in the middle value, 25.5. Dividing 125 by 25.5 gives us 4.9 pounds per square foot. Since we know that the rate in the problem is 50 pounds per square foot (20,000 ÷ 400 = 50), we know that 25.5 is too large. We can then eliminate 160 and 312.5. Dividing 125 by 2.5 gives us 50 pounds per square foot. Therefore, 2.5 is the correct answer.

7. Since the question asks for the value of a single quantity and the answer choices involve only numbers, we can use the Start In The Middle technique.

   If three handbags cost Betty $36 during the sale, each handbag must cost $12. We should start by testing out the middle value, $32. If the decrease was $32 per bag, each handbag must have originally cost $44 (or $264 for six bags). Since this is too high, we can eliminate $39 and $44 as the cost per bag decrease. If the decrease was $20 per bag, each handbag must have originally cost $32 (or $192 for six bags). Therefore, $20 is the correct answer.

8. Since the question asks for the value of a single quantity and the answer choices involve only numbers, we can use the Start In The Middle technique.

   If Sally paid $56 for 5 shirts, each shirt cost $11.20. If Harry paid $86 for 8 shirts, each shirt cost $10.75. Therefore, the correct answer is "Sally, at $11.20."

10. Since the question asks for the value of a single quantity and the answer choices involve only numbers, we can use the Start In The Middle technique.

   We should start by plugging in the middle value, $13. If a pound of coffee at the new price costs $13, each cup must cost $0.52. Therefore, $13 is the correct answer.

1. A positive integer is said to be "pure even" if all of its prime factors are even. Which of the following is not a pure even number?

    A.   32
    B.   16
    C.   64
    D.   24
    E.   8

2. An integer is "multi-mult" if it is a multiple of more than 3 distinct numbers (excluding 1). Which of the following is not a multi-mult number?

    A.   180
    B.   126
    C.   108
    D.   111
    E.   120

3. How many multiples of 2 are factors of 60?

    A.   Seven
    B.   Nine
    C.   Eleven
    D.   Five
    E.   Eight

4. What is the smallest prime factor of 24?

    A.   4
    B.   6
    C.   3
    D.   1
    E.   2

5. How many factors of 90 are multiples of 3?

    A.   Four
    B.   Five
    C.   Two
    D.   Eight
    E.   Seven

6. How many distinct factors does the number 24 have?

    A.   Five
    B.   Two
    C.   Four
    D.   Six
    E.   Eight

7. The number 84 has how many distinct prime factors?

    A.   Four
    B.   Two
    C.   Five
    D.   Three
    E.   One

8. How many of the prime factors of 24 are greater than 5?

    A.   Two
    B.   Three
    C.   One
    D.   Four
    E.   Zero

9. Each of the following is a factor of 72 EXCEPT:

    A.   9
    B.   12
    C.   8
    D.   16
    E.   24

10. Which of the following is divisible by 3 and 6 but is not divisible by 4?

    A.   60
    B.   54
    C.   72
    D.   36
    E.   24

Answers

1. D
2. D
3. E
4. E
5. D
6. E
7. D
8. E
9. D
10. B

Explanations

1. It is helpful to know that 2 is the only even prime number in the world. All of the answer choices have 2 as a factor, but 24 also has 3 as a prime factor whereas the others do not. 24 must be the answer.

2. Since it is a timed test, it is not efficient to list all the factors of each answer choice.

We can eliminate all the answer choices that end in 0 since we know that numbers ending in 0 are divisible by 2, 5 and 10 and since each is divisible by itself.

We can eliminate 108 because we can quickly see that 2, 3, 6, and 12 are all factors.

Listing out the factors of 126 in pairs we obtain:
1 and 126
2 and 63
3 and 42
6 and 21
7 and 18
9 and 14

Therefore the answer must be 111.

3. In a later lesson you will learn that when a question says the phrase "how many" and has numbers written out in English as the answer choices, often the best strategy is to list out the possibilities starting at the beginning.

Listing out the factors of 60, we have:
1 and 60
2 and 30
3 and 20
4 and 15
5 and 12
6 and 10

Of these, 2, 4, 6, 10, 12, 20, 30 and 60 are even numbers (and thus multiples of 2). The answer is eight.

4. It is best to list out all the factors in pairs and then separate out those that are prime. For 24 we have:
1 and 24
2 and 12
3 and 8
4 and 6

The primes are 2 and 3. Remember that 1 is not prime.

5. It is easiest to list out the factors of 90 in pairs:
1 and 90
2 and 45
3 and 30
5 and 18
6 and 15
9 and 10

Of those, the multiples of 3 are 3, 6, 9, 15, 18, 30, 45 and 90. The answer is eight.

6. Instead of drawing a factor tree, which only comes in handy when trying to find the prime factors, list out the factors of 24 in pairs:
1 and 24
2 and 12
3 and 8
4 and 6

That is eight distinct factors. If you had used a factor tree it would have been difficult to see that there are eight factors of 24.

7. Drawing a factor tree and circling all of the factors which are prime indicates that only 2, 3, and 7 are prime.

Pay attention to the word "distinct" in the problem. The factor tree will list the factor 2 twice, but the word "distinct" means it can only be counted once.

8. The easiest way to find "prime factors" is to draw a factor tree. All of the ends of the factor tree are prime factors.

Drawing a factor tree and circling all of the factors which are prime indicates that only 2 and 3 are prime. Neither 2 nor 3 is greater than five, so the answer is zero.

9. Instead of drawing a factor tree (which only comes in handy when trying to find the prime factors), list out the factors of 72 in pairs:

1 and 72

2 and 36

3 and 24

4 and 18

6 and 12

8 and 9

The number 16 was not listed, so it is the answer. Listing out the pairs is often more helpful on this test than factor trees.

10. It is best to look for the answers that are not divisible by four.

Only 54 is not divisible by four, so it must be the answer. To be safe, quickly check to see if 3 and 6 go into 54.