PRACTICE QUESTIONS

1. Which of the following is not even?
   (A) 330
   (B) 436
   (C) 752
   (D) 861
   (E) 974

2. What is the least prime number greater than 50?
   (A) 51
   (B) 53
   (C) 55
   (D) 57
   (E) 59

3. Which of the following is a multiple of 2?
   (A) 271
   (B) 357
   (C) 463
   (D) 599
   (E) 756

4. $\frac{15\times7\times3}{9\times5\times2}=$
   (A) $\frac{2}{7}$
   (B) $\frac{3}{5}$
   (C) $3\frac{1}{2}$
   (D) 7
   (E) $7\frac{1}{2}$

5. What is the least common multiple of 18 and 24?
   (A) 6
   (B) 54
   (C) 72
   (D) 96
   (E) 432

6. Which of the following is a multiple of 3?
   (A) 115
   (B) 370
   (C) 465
   (D) 589
   (E) 890

7. $-6(3-4\times3)=$
   (A) −66
   (B) −54
   (C) −12
   (D) 18
   (E) 54

8. Which of the following is a multiple of 10?
   (A) 10,005
   (B) 10,030
   (C) 10,101
   (D) 100,005
   (E) 101,101

9. Which of the following is a multiple of both 5 and 2?
   (A) 2,203
   (B) 2,342
   (C) 1,005
   (D) 7,790
   (E) 9,821

10. Which of the following is a multiple of both 3 and 10?

(A) 103
(B) 130
(C) 210
(D) 310
(E) 460

11. Which of the following is a multiple of 2, 3, and 5?

(A) 165
(B) 235
(C) 350
(D) 420
(E) 532

12. Which of the following is an even multiple of both 3 and 5?

(A) 135
(B) 155
(C) 250
(D) 350
(E) 390

13. Professor Jones bought a large carton of books. She gave 3 books to each student in her class, and there were no books left over. Which of the following could be the number of books she distributed?

(A) 133
(B) 143
(C) 252
(D) 271
(E) 332

14. Two teams are having a contest. The prize is a box of candy that the members of the winning team will divide evenly. If team A wins, each player will get exactly 3 pieces of candy, and if team B wins, each player will get exactly 5 pieces. Which of the following could be the number of pieces of candy in the box?

(A) 153
(B) 325
(C) 333
(D) 425
(E) 555

15. Three consecutive multiples of 4 have a sum of 60. What is the greatest of these numbers?

(A) 8
(B) 12
(C) 16
(D) 20
(E) 24

16. Sheila cuts a 60-foot wire cable into equal strips of $\frac{4}{5}$ of a foot each. How many strips does she make?

(A) 48
(B) 51
(C) 60
(D) 70
(E) 75

17. Which of the following is NOT odd?

(A) 349
(B) 537
(C) 735
(D) 841
(E) 918

18. Which of the following can be the sum of two negative numbers?

(A) 4
(B) 2
(C) 1
(D) 0
(E) −1

19. Which of the following is NOT a prime number?

(A) 2
(B) 7
(C) 17
(D) 87
(E) 101

20. All of the following can be the product of a negative integer and positive integer EXCEPT

(A) 1
(B) −1
(C) −2
(D) −4
(E) −6

21. Susie and Dennis are training for a marathon. On Monday, they both run 3.2 miles. On Tuesday, Susie runs $5\frac{1}{5}$ miles and Dennis runs 3.6 miles. On Wednesday, Susie runs 4.8 miles and Dennis runs $2\frac{2}{5}$ miles. During those 3 days, how many more miles does Susie run than Dennis?

(A) 4.8
(B) 4
(C) 3.2
(D) 3
(E) 2.4

22. Which number is a multiple of 60?

(A) 213
(B) 350
(C) 540
(D) 666
(E) 1,060

23. Two odd integers and one even integer are multiplied together. Which of the following could be their product?

(A) 1.5
(B) 3
(C) 6
(D) 7.2
(E) 15

24. If the number 9,899,399 is increased by 2,082, the result will be

(A) 9,902,481
(B) 9,901,481
(C) 9,901,471
(D) 9,891,481
(E) 901,481

25. What is the sum of five consecutive integers if the middle one is 13?

(A) 55
(B) 60
(C) 65
(D) 70
(E) 75

26. $\frac{4x^5}{2x^2} =$

(A) $2x^2$
(B) $2x^3$
(C) $2x^4$
(D) $4x^2$
(E) $4x^3$

27. $-2^3(1-2)^3 + (-2)^3 =$

(A) −12
(B) −4
(C) 0
(D) 4
(E) 12

28. n is an odd integer and $10 < n < 19$. What is the mean of all possible values of n?

(A) 13
(B) 13.5
(C) 14
(D) 14.5
(E) 15.5

29. $a\Delta b = \frac{3a}{b}$. What is $\frac{14}{32}\Delta 1\frac{3}{4}$?

(A) $\frac{1}{4}$
(B) $\frac{1}{3}$
(C) $\frac{1}{2}$
(D) $\frac{3}{4}$
(E) $\frac{49}{64}$

30. Jon works 4.5 hours a day, 3 days each week after school. He is paid $7.25 per hour. How much is his weekly pay (rounded to the next highest cent)?

(A) $13.50
(B) $21.75
(C) $32.63
(D) $54
(E) $97.88

31. Zim buys a calculator that is marked 30% off. If he pays $35, what was the original price?

(A) $24.50
(B) $45.50
(C) $47
(D) $50
(E) $62.50

32. A museum records 16 visitors to an exhibit on Monday, 21 on Tuesday, 20 on Wednesday, 17 on Thursday, 19 on Friday, 21 on Saturday, and 17 on Sunday, what is the median number of visitors for the week?

(A) 18.5
(B) 18.75
(C) 19
(D) 19.5
(E) 19.75

33. A bag contains 8 white, 4 red, 7 green, and 5 blue marbles. Eight marbles are withdrawn randomly. How many of the withdrawn marbles were white if the chance of drawing a white marble is now $\frac{1}{4}$?

(A) 0
(B) 3
(C) 4
(D) 5
(E) 6

34. $\sqrt{1,500} =$

(A) $10 + \sqrt{15}$
(B) $10\sqrt{15}$
(C) 25
(D) $100 + \sqrt{15}$
(E) $10\sqrt{150}$

35. $2(3 \times 2)^2 - 27(6 \div 2) + 3^2 =$

(A) 72
(B) 9
(C) 3
(D) 0
(E) −24

36. Which of the following numbers is closest to the product of 48.9×21.2?

(A) 10,000
(B) 8,000
(C) 1,000
(D) 100
(E) 70

37. $|16 - 25| + \sqrt{25 - 16} =$

(A) −12
(B) −6
(C) 0
(D) 6
(E) 12

38. Which of the following is 81,455 rounded to the nearest 100?

(A) 81,000
(B) 81,400
(C) 81,500
(D) 82,000
(E) 90,000

39. If 35% of x is 7, what is x% of 35?

(A) 7
(B) 20
(C) 28
(D) 35
(E) 42

40. A number is considered "blue" if the sum of its digits is equal to the product of its digits. Which of the following numbers is "blue"?

(A) 111
(B) 220
(C) 321
(D) 422
(E) 521

41. To "fix" a number, you must perform the following four steps:

Step 1: Raise the number to the third power.

Step 2: Divide the result by 2.

Step 3: Take the absolute value of the result of Step 2.

Step 4: Round off this result to the nearest whole number.

When you "fix" −3, you get

(A) −13
(B) 4
(C) 5
(D) 13
(E) 14

42. When D is divided by 15, the result is 6 with a remainder of 2. What is the remainder when D is divided by 6?

(A) 0
(B) 1
(C) 2
(D) 3
(E) 4

43. For any two numbers a and b, $a \,?\, b = (a + b)(a - b)$. For example, $10 \,?\, 5 = (10 + 5)(10 - 5) = (15)(5) = 75$. The value of $7 \,?\, 5$ is

(A) 2
(B) 12
(C) 24
(D) 36
(E) 48

44. What is the greatest integer less than $\frac{71}{6}$?

(A) 9
(B) 10
(C) 11
(D) 12
(E) 13

45. Which of the following is NOT less than 0.25?

(A) $\frac{2}{9}$
(B) $\frac{3}{14}$
(C) $\frac{16}{64}$
(D) $\frac{19}{80}$
(E) $\frac{4}{17}$

46. If the average of five consecutive odd numbers is 11, then the largest number is

(A) 17
(B) 15
(C) 13
(D) 11
(E) 9

PRACTICE QUESTION ANSWERS

1. D

The way to tell if an integer is even is to look at the last digit to the right—the ones digit. If that digit is divisible by 2, or is 0, the number is even. Looking at the choices, only (D) ends in a number that isn't divisible by 2, so it is not even.

2. B

A prime number is an integer greater than 1 that is divisible by only two different positive integers, itself and 1. Of the choices, only (B), 53, and (E), 59, are prime. You want the least prime number greater than 50, so (B) is correct. Using the divisibility rules would quickly show you that 51 and 57 are divisible by 3, while 55 is divisible by 5.

3. E

If the ones digit of a number is even (0, 2, 4, 6, or 8), the number is even. The only choice whose last digit is even is (E), 756.

4. C

Before you do the multiplication, see which common factors in the numerator and denominator can be canceled. Canceling a 3 from the 3 in the numerator and the 9 in the denominator leaves $\frac{15 \times 7 \times 1}{3 \times 5 \times 2}$. Canceling a 5 from the 15 in the numerator and the 5 in the denominator leaves $\frac{3 \times 7 \times 1}{3 \times 1 \times 2}$. Canceling the 3 in the numerator and the 3 in the denominator leaves $\frac{7 \times 1}{1 \times 2} = \frac{7}{2} = 3\frac{1}{2}$, (C).

5. C

The least common multiple (LCM) of two integers is the product of their prime factors, each raised to the highest power with which it appears. The prime factorization of 18 is 2×3^2 and that of 24 is $2^3 \times 3$. So their LCM is $2^3 \times 3^2 = 8 \times 9 = 72$. You could also find their LCM by checking out the multiples of the larger integer until you find the one that's also a multiple of the smaller. Check out the multiples of 24: 24? No. 48? No. 72? Yes, $72 = 4 \times 18$.

6. C

If a number is divisible by 3, the sum of its digits will be divisible by 3. Checking the answer choices, only (C), 465, works since $4 + 6 + 5 = 15$, which is divisible by 3.

7. E

According to PEMDAS, start in the parentheses. Perform multiplication before subtraction: $-6(3 - 12)$. After the subtraction: $-6(-9)$. Since a negative times a negative is a positive, the answer is 54, (E).

8. B

If a number is divisible by 10, its last digit will be a 0. Only (B) fits this criterion.

9. D

If a number is divisible by both 5 and 2, then it must also be divisible by 5×2 or 10. Since a number divisible by 10 must have a 0 as its last digit, (D) is correct.

10. C

For a number to be divisible by 3 and 10, it must satisfy the divisibility rules of both: Its last digit must be 0, which automatically eliminates (A), and the sum of its digits must be divisible by 3. Checking the rest of the answer choices, only (C) is also divisible by 3, since $2 + 1 + 0 = 3$.

11. D

For a number to be a multiple of both 2 and 5, it must also be a multiple of $2 \times 5 = 10$. This means it must have a 0 as its last digit, which eliminates all but (C) and (D). To be a multiple of 3, the number's digits must sum to a multiple of 3. (D) is the only remaining choice that fits this requirement, since $4 + 2 + 0 = 6$.

12. E

Since an even number is divisible by 2, the question is asking for a number that is divisible by 2, 3, and 5. If the number is divisible by 2 and 5, it must also be divisible by 10, so its last digit must be 0. To be a multiple of 3, its digits must sum to a multiple of 3. Eliminate (A) and (B) since they don't end in 0. Of the remaining choices, only (E) is a multiple of 3, since $3 + 9 + 0 = 12$.

13. C

If Professor Jones was able to distribute all the books in groups of 3 without any left over, the number of books she started with was divisible by 3. Whichever choice is divisible by 3 must therefore be correct. For a number to be divisible by 3, the sum of its digits must also be divisible by 3. Only (C) fits this requirement: $2 + 5 + 2 = 9$.

14. E

The problem tells you that the number of pieces of candy in the box can be evenly divided by 3 and 5. So the correct answer has a 0 or 5 as its last digit, and the sum of its digits is divisible by 3. Eliminate (A) and (C) since they don't end in either 0 or 5. Of the remaining choices, only (E) is also divisible by 3, since $5 + 5 + 5 = 15$.

15. E

Use the answer choices to help find the solution. When backsolving, start with the middle choice, since it will help you determine if the correct answer needs to be greater or less than it. In this case, the middle choice is 16. The sum of 16 and 2 numbers that are each smaller than 16 has to be less than 3×16 or 48, so it is obviously too small. Therefore, (A) and (B) must also be too small, and you can eliminate all three. Try (D), 20. Again, 20 plus two numbers smaller than 20 will be less than 3×20 or 60, so it's not correct. The only choice remaining is (E), 24, so it must be correct. To prove it, 24 plus the two preceding consecutive multiples of 4, which are 16 and 20, do indeed sum to 60: $16 + 20 + 24 = 60$.

16. E

When you're asked how many strips $\frac{4}{5}$ of a foot long can be cut from a 60-foot piece of wire, you're being asked how many times $\frac{4}{5}$ goes into 60, or what is $60 \div \frac{4}{5}$. Before you do the division, you can eliminate some unreasonable answer choices. Since $\frac{4}{5}$ is less than 1, $\frac{4}{5}$ must go into 60 more than 60 times. Eliminate (A), (B), and (C) because they're all less than or equal to 60. Dividing by a fraction is the same as multiplying by its reciprocal, so $60 \div \frac{4}{5} = 60 \times \frac{5}{4} = 75$.

17. E

If a number is odd, its last digit must be odd. (E) ends in an even digit, so it is not odd.

18. E

The sum of two negative numbers is always negative. (E) is the only negative choice, so it must be correct. If you're wondering how two negative numbers can add up to −1, remember that "number"

doesn't necessarily mean "integer." It can also mean "fraction." For example, $\left(-\frac{1}{4}\right)+\left(-\frac{3}{4}\right)=-1$. Always read the questions carefully to see what types of numbers are involved.

19. D

A prime number has only two different positive factors, 1 and itself. The numbers 2, 7, and 17 are obviously prime, so eliminate them. Use the divisibility rules to check out the two remaining choices. Both end in an odd number, so neither is divisible by 2. But the digits of 87 sum to 15, which is a multiple of 3, so 87 is divisible by 3 and is therefore not prime.

20. A

The product of a positive integer and a negative integer is always negative. (A) is positive, so it couldn't be the product of a negative and a positive.

21. B

The simplest way to solve this problem is to convert the numbers so that they're all decimals or all fractions: $5\frac{1}{5}=5\frac{2}{10}=5.2$; $2\frac{2}{5}=2\frac{4}{10}=2.4$. Now you can more easily compare the distances. On Monday, they ran the same number of miles. On Tuesday, Susie ran 5.2 miles and Dennis ran 3.6 miles. The difference between the two amounts is 5.2 – 3.6, or 1.6, so on Tuesday Susie ran 1.6 more miles than Dennis did. On Wednesday, Susie ran 4.8 miles and Dennis ran 2.4. Then 4.8 – 2.4 = 2.4, so on Wednesday Susie ran 2.4 miles more than Dennis. The total difference for the three days is 1.6 + 2.4 = 4.0 more miles.

22. C

A number that is a multiple of 60 must be a multiple of every factor of 60. The factors of 60 are 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, and 60. (A) and (D) are not multiples of 10. (B) and (E) are not multiples of 3. The answer is 540, (C).

23. C

The product of three integers must be an integer, so eliminate (A) and (D). A product of integers that has at least one even factor is even, so the product of two odd integers and one even integer must be even. The only even choice is 6, (C).

24. B

This question is simply asking for the sum of 9,899,399 and 2,082, which is 9,901,481, (B).

25. C

If the middle of five consecutive integers is 13, the first two are 11 and 12 and the last two are 14 and 15. So the sum is 11 + 12 + 13 + 14 + 15 = 65. You could get to this answer more quickly if you knew that the middle term in a group of consecutive numbers is equal to the average of the group of numbers. In other words, the average of these five integers is 13, so their sum would be 13 × 5 = 65.

26. B

Simplify the expression by first simplifying the fraction $\frac{4}{2}$, which equals 2. Then, to divide the exponential expressions with the same base, subtract the exponents:

$$\frac{x^5}{x^2}=x^{5-2}$$

$$=x^3$$

$$\text{So } \frac{4x^5}{2x^2}=2x^3$$

27. C

A negative number raised to an odd power is negative. Using PEMDAS,

$$\begin{aligned}&-2^3(1-2)^3+(-2)^3\\&=-2^3(-1)^3+(-2)^3\\&=-8(-1)+(-8)\\&=8+(-8)\\&=8-8\\&=0\end{aligned}$$

28. C

The mean (or average) is the sum of the terms divided by the number of terms. The numbers included are 11, 13, 15, and 17. Note that 19 is not in the set, since n is less than 19. The average is $\frac{11+13+15+17}{4}=\frac{56}{4}=14$. The average is an even number although the numbers in the set are all odd.

29. D

Substitute the number on the left for a and the number on the right for b in the formula given for the strange symbol. First, convert b to an improper fraction: $\frac{7}{4}$. So the numerator is 3 times $\frac{14}{32}$, or (simplifying the fraction) 3 times $\frac{7}{16}$, or $\frac{21}{16}$. Dividing by $\frac{7}{4}$ is the same as multiplying by $\frac{4}{7}$. So we have $\frac{21}{16}\times\frac{4}{7}$ or $\frac{3}{4}\times\frac{1}{1}=\frac{3}{4}$.

30. E

Multiply the number of hours per day times the number of days times the rate per hour. $4.5 \times 3 \times 7.25 = 97.875$, which rounds to $97.88.

31. D

Let's say the original price is x dollars. The price paid is 70 percent of the original price (100% minus 30%). So, $0.7x = 35$; $70x = 3{,}500$; $x = 50$.

32. C

The numbers for the week are 16, 21, 20, 17, 19, 21, 17. Listing them in ascending order, we have 16, 17, 17, 19, 20, 21, 21. There are an odd number of numbers, so the median is the number in the middle of the set: 19.

33. C

By adding the 8 white, 4 red, 7 green, and 5 blue marbles, we have a total of 24 marbles. If 8 are withdrawn, 16 remain in the bag. If the chance of drawing a white marble is now one-fourth, 4 white marbles remain in the bag, so 8 – 4, or 4 must have been drawn out.

34. B

To simplify the square root of a large number, break the number down into two or more factors and write the number as the product of the square roots of those factors. This is especially useful when one of the factors is a perfect square. In this case, break 1,500 down into two factors. $1{,}500 = 15 \times 100$, and 100 is a perfect square. So $1{,}500 = \sqrt{100 \times 15} = \sqrt{100} \times \sqrt{15} = 10\sqrt{15}$.

35. D

This is a basic arithmetic problem, and if you remember PEMDAS, it will be a breeze. PEMDAS tells you the order in which you need to do the different calculations: parentheses, exponents, multiplication and division, addition and subtraction. Take the expression and solve the parts in that order:

$$2(3 \times 2)^2 - 27(6 \div 2) + 3^2$$
$$= 2(6)^2 - 27(3) + 3^2$$
$$= 2(36) - 27(3) + 9$$
$$= 72 - 81 + 9$$
$$= -9 + 9$$
$$= 0$$

36. C

One way to solve this one would be to do the calculation. But this is really a test to see if you understand how to approximate a calculation by rounding off numbers. You could round off both numbers to the nearest whole number, but that wouldn't make the calculation much easier. And besides, the answer choices you're choosing between are pretty far apart, so you can probably round both numbers to the nearest ten. Then 48.9 is close to 50, so round it up to 50. And 21.2 is close to 20, so round it down to 20. Now the multiplication is 50×20 or 1,000, choice (C).

37. E

In terms of order of operations, treat absolute value bars and roots just like parentheses: Simplify them first. In this case, first find the value of $16 - 25$: $16 - 25 = -9$. The absolute value of a number is its distance from zero on the number line. Now -9 is 9 units from zero, so

$$|16 - 25| = |-9|$$
$$= 9$$

Now, simplify $\sqrt{25 - 16}$. $25 - 16 = 9$, so $\sqrt{25 - 16} = \sqrt{9}$. Because the radical sign is being used, simplify $\sqrt{9}$ by finding only the positive square root of 9, which is 3. The problem becomes $9 + 3$, which is 12, (E).

38. C

You're being asked whether 81,455 is closer to 81,400 or 81,500. Logically, because 81,455 is greater than 81,450 (the halfway point between 81,400 and 81,500), it is closer to 81,500. Formally, to round a number to the nearest hundred, consider the tens digit. If the tens digit is 5 or greater, round the hundreds digit up 1. If the tens digit is 4 or smaller, keep the same hundreds digit. Here the tens digit is 5, so round the hundreds digit up 1 from 4 to 5. To the nearest 100, 81,455 is 81,500, (C).

39. A

This problem is a snap if you remember that $a\%$ of $b = b\%$ of a. In this case, 35% of $x = x\%$ of 35, so $x\%$ of 35 is 7.

If you didn't remember that $a\%$ of $b = b\%$ of a, you could also have solved the statement that 35% of x is 7 for x and then found $x\%$ of 35. Percent × Whole = Part, so

$$\frac{35}{100}x = 7$$
$$35x = 700$$
$$x = 20$$

So $x\%$ of 35 is 20% of 35, which is 7, (A).

40. C

In this type of problem, you're given a rule or definition you've never heard before and then asked a question involving that new rule. In this example, you're given a definition of the term "blue": a number is "blue" if the sum of its digits is equal to the product of its digits. To solve, simply try each answer until you find the one that fits the definition of "blue." Only (C) is blue, because $3 + 2 + 1 = 3 \times 2 \times 1 = 6$.

41. E

This is another invented rule question. This time all you have to do is follow directions. To "fix" −3, you first raise it to the third power: $(-3)^3 = -27$. Then divide this result by 2: $-27 \div 2 = -13.5$. Next, take the absolute value of −13.5, which is just 13.5. Finally, round off this result to the nearest integer: 13.5 rounds up to 14, (E).

42. C

One way to do this problem is to realize that the remainder would have to be the same whether D were divided by 15 or 6, since $D = 15 \times 6 + 2$. In other words, D is 2 more than a multiple of both 15 and 6. Hence, the remainder is 2 regardless of whether D is divided by 15 or 6.

Otherwise, find the actual value of D by calculating:

$$\begin{aligned} D &= 15 \times 6 + 2 \\ &= 90 + 2 \\ &= 92 \end{aligned}$$

Now divide D by 6 to find the remainder: $92 \div 6 = 15$, with a remainder of 2. (C) is correct.

43. C

This is another follow-the-instructions problem. Just replace a with 7 and b with 5. So $7 ? 5 = (7 + 5)(7 - 5) = (12)(2) = 24$, (C).

44. C

$\frac{71}{6} = 11\frac{5}{6}$, so the greatest integer less than $\frac{71}{6}$ is 11.

45. C

$0.25 = \frac{1}{4}$, so just find which choice is NOT less than $\frac{1}{4}$. (C), $\frac{16}{64}$, reduces to $\frac{1}{4}$ so it is equal to, not less than, 0.25.

46. B

The average of an odd number of consecutive numbers is equal to the middle term. Since 11 is the average of these five consecutive odd numbers, 11 is the third and middle term. So the five numbers are 7, 9, 11, 13, and 15. The largest number is 15.