

# Additional Estimation Sequence

1. What two numbers should come next in the series 1, 1, 2, 3, 5, 8, 13, ...?

18, 24

20, 28

21, 29

21, 34

2. What number should be next in the series 108, 104, 98, 90, 80, ...?

68

72

76

64

3. What number should come next in the series 41, 44, 48, 53, 59, ...?

64

65

66

67

4. Haley's dad offered to pay for the team's pizza party. The cost, including tip, would be \$4.05 per person. There were 15 team members at the party. Which of the following is the best estimate of the total bill?

Less than \$30

Between \$30 and \$40

Between \$40 and \$50

Between \$60 and \$70

More than \$70

Look at the row of numbers below to answer question 5.

4 8 24 96 ?

5. What number should come next?

72

120

384

480

Look at the row of numbers below to answer question 6.

27 9 3 1 ?

6. What number should come next?

2

$\frac{1}{3}$

3

$\frac{1}{9}$

7. Look at the row of numbers below. What number should come next?

1 2 0 1 - 1 0 ?

-2

- 1

0

1

8. Arrange the following numbers in order from the least to greatest: 23, 42, 60, 9, 101.

23, 42, 60, 9, 101

60, 9, 101, 23, 42

101, 23, 60, 9, 42

60, 23, 9, 101, 42

9, 60, 101, 42, 23

9. Put the following integers in order from least to greatest:

-52, 16, -12, 14, 8, -5, 0

-52, 16, -12, 14, 8, -5, 0

0, -5, 8, -12, 14, 16, -52

0, -5, -12, -52, 8, 14, 16

-5, -12, -52, 0, 8, 14, 16

-52, -12, -5, 0, 8, 14, 16

10. In the year 2000, 35% of the company sales were in electronics. The table below shows how electronic sales have changed for the company over the years. Find the percent of electronics sold in 2005.

Years	Percent Change
2000 - 2001	-2
2001 - 2002	-1
2002 - 2003	+6
2003 - 2004	-1
2004 - 2005	+2

2%

11%

39%

42%

47%

#### Answers and Explanations

1. D: In this series, each number is the sum of the two preceding numbers. For example,  $3 = 1 + 2$ , and  $5 = 3 + 2$ . Therefore, the number following 13 must be  $13 + 8 = 21$ , and the next number must be  $21 + 13 = 34$ .

2. A: In this series, the number subtracted from the preceding term increases by two for each term:  $108 - 4 = 104$ ;  $104 - 6 = 98$ ;  $98 - 8 = 90$ ;  $90 - 10 = 80$ . For the next term, subtract 12:  $80 - 12 = 68$ . Choice A is correct.

3. C: In this series, the number added to the preceding term increases by one for each term:  $41 + 3 = 44$ ;  $44 + 4 = 48$ ;  $48 + 5 = 53$ ;  $53 + 6 = 59$ . For the next term, add 7:  $59 + 7 = 66$ . Choice C is correct.

4. D: To estimate, round \$4.05 to an even \$4.00, then multiply by the number of people (15). The result is \$60.

5. D: 480. The series of numbers is formed by multiplying the previous number by a factor that increases by one each time:  $4 * 2 = 8$ , then  $8 * 3 = 24$ , then  $24 * 4 = 96$ . So the next operation is to multiply 96 by 5, resulting in 480.

6. B:  $1/3$ . Each number is found by dividing the previous one by three:  $27/3 = 9$ ,  $9/3 = 3$ , and  $3/3 = 1$ . The next number in the series is  $1/3 = 1/3$ .

7. A: -2. There are two different patterns going on here. First, we add 1, and then we subtract 2.

$1 + 1 = 2$ , then  $2 - 2 = 0$ . Further,  $0 + 1 = 1$ , and  $1 - 2 = -1$ . Next,  $-1 + 1 = 0$ , and so the last thing to do is subtract 2, giving us  $0 - 2 = -2$ .

8. D: When a number is raised to a power, it is multiplied by itself as many times as the power indicates. For example,  $2^3 = 2 * 2 * 2 = 8$ . A number raised to the power of 0 is always equal to 1, so 60 is the smallest number shown. Similarly, for the other numbers:

$$9 = 9; 10^1 = 10; 4^2 = 4 * 4 = 16.$$

9. E: Think of the numbers as they would appear on a number line to place them in the correct order.

10. C: Let  $x$  equal the percent of electronics sold in 2005.

Then, using the series of percent changes listed in the table, we have:

$$x = 35 + (-2) + (-1) + (+6) + (-1) + (+2)$$

$$x = (35 + 6 + 2) + (-2 + (-1) + (-1))$$

$$x = (43) + (-4)$$

$$x = 39$$