

**ACCUPLACER**<sup>®</sup>

 CollegeBoard

**NEXT-GENERATION**

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# Arithmetic

**Sample Questions**

# The College Board

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## ACCUPLACER Arithmetic Sample Questions

The Next-Generation Arithmetic placement test is a computer adaptive assessment of test-takers' ability for selected mathematics content. Questions will focus on computation, order of operations, estimation and rounding, comparing and ordering values in different formats, and recognizing equivalent values across formats. In addition, questions may assess a student's math ability via computational or fluency skills, conceptual understanding, or the capacity to apply mathematics presented in a context. All questions are multiple choice in format and appear discretely (stand alone) across the assessment. The following knowledge and skill categories are assessed:

- Whole number operations
- Fraction operations
- Decimal operations
- Percent
- Number comparisons and equivalents

## Sample Questions

Choose the best answer. If necessary, use the paper you were given.

- Which of the following fractions is equal to 0.06?
  - $\frac{1}{6}$
  - $\frac{1}{60}$
  - $\frac{6}{10}$
  - $\frac{6}{100}$
- A club has 36 members. If each member donates 12 items for an auction, how many items will there be in the auction?
  - 48
  - 108
  - 422
  - 432
- What is the value of  $\frac{4}{10} + \frac{3}{100}$ ?
  - $\frac{43}{100}$
  - $\frac{43}{110}$
  - $\frac{7}{10}$
  - $\frac{7}{110}$
- A conference planner has put together 280 binders for attendees and another 31 binders for presenters. How many total binders did the planner put together for attendees and presenters?
  - 211
  - 249
  - 311
  - 590
- A store stocked 150 cans of popcorn for a weekend sale. That weekend, 72 of the cans sold. What percent of the cans of popcorn stocked were sold that weekend?
  - 2%
  - 5%
  - 48%
  - 72%
- $\frac{8}{3}$ , 2.28,  $\frac{10}{12}$ , 0.199  
What number in the list above has the greatest value?
  - $\frac{8}{3}$
  - 2.28
  - $\frac{10}{12}$
  - 0.199
- If Manuel deposits 25% of \$130 into a savings account, what is the amount of his deposit?
  - \$5.20
  - \$25.00
  - \$32.50
  - \$97.50
- What is  $1,582 + 761$ ?
  - 1,119
  - 1,243
  - 1,343
  - 2,343
- Xiaoming is making cookies. Each batch of cookies uses 3 eggs. If Xiaoming has 20 eggs, and assuming he has enough of the other ingredients to make the cookies, what is the greatest number of batches that he can make?
  - 3
  - 6
  - 7
  - 17
- What is the value of  $3.85 + 0.004 + 0.117$ ?
  - 3.9611
  - 3.961
  - 3.971
  - 5.06
- Which of the following is equivalent to  $\frac{8}{25}$ ?
  - 0.02
  - 0.32
  - 0.825
  - 3.125
- What is the remainder when 599 is divided by 9?
  - 0
  - 5
  - 6
  - 9

13. A machine is currently set to a feed rate of 5.921 inches per minute (IPM). The machinist changes this setting to 6.088 IPM. By how much did the machinist increase the feed rate?
- A. 0.167 IPM  
B. 1.167 IPM  
C. 1.833 IPM  
D. 1.967 IPM
14.  $0.075$ ,  $0.75\%$ ,  $\frac{3}{4}$
- Which of the following correctly orders the values above from least to greatest?
- A.  $0.75\%$ ,  $0.075$ ,  $\frac{3}{4}$   
B.  $0.75\%$ ,  $\frac{3}{4}$ ,  $0.075$   
C.  $\frac{3}{4}$ ,  $0.75\%$ ,  $0.075$   
D.  $0.075$ ,  $0.75\%$ ,  $\frac{3}{4}$
15. What is the value of  $2.84 \times 3.9$ ?
- A. 3.408  
B. 11.076  
C. 34.08  
D. 110.76
16. What is 0.8637 rounded to the nearest hundredth?
- A. 0.86  
B. 0.863  
C. 0.864  
D. 0.87
17. 60% of what number is equal to 30?
- A. 0.5  
B. 2  
C. 18  
D. 50
18. If  $\frac{4}{3} \div \frac{1}{6} = p$ , then the value of  $p$  is between which of the following pairs of numbers?
- A. 3 and 4  
B. 5 and 6  
C. 6 and 7  
D. 7 and 9
19. Which of the following inequalities is true?
- A.  $\frac{3}{4} < \frac{5}{7}$   
B.  $\frac{2}{3} > \frac{5}{6}$   
C.  $\frac{5}{8} > \frac{6}{10}$   
D.  $\frac{4}{5} < \frac{2}{9}$
20. Carole works at a bookstore and a restaurant. In a 28-day period, Carole worked  $\frac{1}{4}$  of the days at the bookstore and did not work  $\frac{1}{14}$  of the days. On the remaining days Carole worked at the restaurant. How many days did Carole work at the restaurant during the 28-day period?
- A. 25  
B. 19  
C. 10  
D. 9

## Answer Key

1. D
2. D
3. A
4. C
5. C
6. A
7. C
8. D
9. B
10. C
11. B
12. B
13. A
14. A
15. B
16. A
17. D
18. D
19. C
20. B

## Rationales

- 1. Choice D is correct.** The number 0.06 is the same as six-hundredths, which when written as a fraction is  $\frac{6}{100}$ . Choice A is incorrect because  $\frac{1}{6}$  is equivalent to one-sixth, or 0.16 $\bar{6}$ . Choice B is incorrect because  $\frac{1}{60}$  is equivalent to one-sixtieth, or 0.016 $\bar{6}$ . Choice C is incorrect because  $\frac{6}{10}$  is equivalent to six-tenths, or 0.6.
- 2. Choice D is correct.** To find the total number of items, multiply the total number of members by the number of items each member will donate. This is represented by  $36 \times 12 = 432$ . Choice A is incorrect because this results from adding instead of multiplying. Choice B is incorrect because a multiplication error was made. This results from not using a placeholder zero or writing the numbers starting in the tens place when multiplying the second digit. Choice C is incorrect because a multiplication error was made. This results from making an error when carrying from the ones digit to the tens digit.
- 3. Choice A is correct.** The expression  $\frac{4}{10} + \frac{3}{100}$  can be rewritten as  $\frac{40}{100} + \frac{3}{100}$ , which is equal to  $\frac{43}{100}$ . Choice B is incorrect because it results from combining the numerators to create a two-digit number and adding the denominators. Choice C is incorrect because it results from adding the numerators and using the denominator of the first number in the sum. Choice D is incorrect because it results from adding the numerators and denominators separately.
- 4. Choice C is correct.** The total number of binders the planner put together for attendees and presenters is  $280 + 31 = 311$ . Adding the ones place ( $0 + 1$ ) results in the digit 1, adding the tens place ( $8 + 3$ ) results in the number 11, which should be recorded as a 1 in the tens place and a 1 carried to the hundreds place, then adding the hundreds place ( $2 + 1$ ) results in the digit 3. Choice A is incorrect. This answer results from not carrying a 1 to the hundreds place after adding the tens place. Choice B is incorrect. This answer is the result of subtracting the presenter binders from the attendee binders. However, the total number of binders will be found through addition, not subtraction. Choice D is incorrect. This answer results from incorrectly adding the numbers.
- 5. Choice C is correct.** Divide the number of cans sold by the number of cans stocked and multiply by 100 to find the percent:  $72 \div 150 \times 100 = 48\%$ . Choice A is incorrect. This is the approximate result of dividing 150 by 72. Choice B is incorrect. This is the approximate result of dividing 72 by 15. Choice D is incorrect. This is the number of cans sold represented as a percent.
- 6. Choice A is correct.** The fraction  $\frac{8}{3}$  is greater than 1 because the numerator is larger than the denominator. This makes it greater than choice C or choice D, which are both less than 1. The fraction  $\frac{8}{3}$  can be converted to a mixed number ( $2\frac{2}{3}$ ) or decimal (approximately 2.66) by dividing 8 by 3. This makes it easier to compare choice A to the other choices. Choices B, C, and D are incorrect because  $\frac{8}{3}$  (or approximately 2.66) is greater than 2.28,  $\frac{10}{12}$ , and 0.199.

- 7. Choice C is correct.** To find 25% of \$130.00, multiply \$130.00 by 0.25, which is \$32.50. Choice A is incorrect because \$5.20 is 4% of \$130, which results from dividing \$130.00 by 25. Choice B is incorrect because \$25.00 is approximately 19% of \$130, which may be the result of misunderstanding 25% to be \$25. Choice D is incorrect because \$97.50 is 75% of \$130, which is not the amount that will go into the savings account.
- 8. Choice D is correct.**  $1,582 + 761 = 2,343$ . Choices A, B, and C are incorrect. Choice A results from adding and carrying from left to right instead of right to left. Choice B is incorrect because no numbers are carried to the next place value. Choice C is incorrect because the 1 from the hundreds place is not carried to the thousands place.
- 9. Choice B is correct.** If Xiaoming has 20 eggs, and each batch of cookies uses 3 eggs, the number of batches can be found by dividing 20 by 3. This does not divide evenly, so the number should be rounded down to 6 because Xiaoming does not have enough eggs to make 7 batches ( $7 \times 3 = 21$ ). Choice A is incorrect because 3 batches would use only 9 eggs ( $3 \times 3$  eggs). This means that Xiaoming would have 11 eggs left, which is enough to make more batches. Choice C is incorrect because 7 batches would use 21 eggs ( $3 \times 7 = 21$ ), but Xiaoming has only 20 eggs. Choice D is incorrect because 17 batches would use 51 eggs ( $17 \times 3 = 51$ ), but Xiaoming has only 20 eggs.
- 10. Choice C is correct.** Using the standard algorithm, the sum of the thousandths places ( $7 + 4$ ) is 11, so a 1 should be recorded in the thousandths place and a 1 carried to the hundredths place. The sum of the hundredths places ( $5 + 0 + 1 + 1$ ) is 7, the sum of the tenths places is 9, and the sum of the ones places is 3. This results in 3.971. Choice A is incorrect. This results from adding from left to right and recording an 11 as the result of adding the thousandths places. Choice B is incorrect. This results from not carrying the 1 from the thousandths place to the hundredths place. Choice D is incorrect. This is the sum of 3.85, 0.04, and 1.17.
- 11. Choice B is correct.** The fraction  $\frac{8}{25}$  can be written as  $\frac{32}{100}$ , which can be interpreted as thirty-two hundredths, or 0.32. Choice A is incorrect. This may be the result of dividing the numerator by 4 instead of multiplying when converting to a common denominator of 100. Choice C is incorrect. This may be the result of trying to form a number using the numerator and the denominator of the fraction. Choice D is incorrect. This is the result of 25 divided by 8.
- 12. Choice B is correct.** The result when 599 is divided by 9 is 66 with a remainder of 5. Multiplying  $9 \times 66 = 594$  and  $599 - 594 = 5$ , which is the remainder. Choice A is incorrect. This may be the result of thinking that 9 divides evenly into 599. Choice C is incorrect. This may be the result of determining that 9 goes into 599 sixty-six times and misinterpreting the meaning of this number. Choice D is incorrect because this is the divisor, not the remainder.
- 13. Choice A is correct.** The amount by which the feed rate increases is the difference between the second feed rate and the first feed rate. This is represented by  $6.088 - 5.921 = 0.167$ . Choices B, C, and D are incorrect and may be the result of errors when subtracting the two numbers given.

- 14. Choice A is correct.** To best compare the numbers, they should be put in the same format. The percent 0.75% can be converted to a decimal by dividing 0.75 by 100, which gives 0.0075. The fraction  $\frac{3}{4}$  can be converted to a decimal by dividing 3 by 4, which gives 0.75. Placing these numbers in order from least to greatest yields 0.0075, 0.075, and 0.75. Choices B, C, and D are incorrect because none of them order the numbers from least to greatest. Choice B is incorrect because  $\frac{3}{4}$  is greater than 0.075. Choice C is incorrect because  $\frac{3}{4}$  is the greatest value, not the least. Choice D is incorrect because 0.75% is less than 0.075.
- 15. Choice B is correct.** Using the standard algorithm to multiply the tenths place of 3.9 by 2.84 results in 2.556 and then multiplying the ones place of 3.9 by 2.84 results in 8.520, since each product must have three places to the right of the decimal. The sum of these two numbers is  $2.556 + 8.520 = 11.076$ . Choice A is incorrect. This results from not using a placeholder zero when multiplying the ones place. Choice C is incorrect. This results from not using a placeholder zero when multiplying the ones place and incorrectly placing the decimal point in the resulting number. Choice D is incorrect. This results from placing the decimal point to match the number of decimal places in 2.84.
- 16. Choice A is correct.** The second digit to the right of the decimal point is in the hundredths place and the third number to the right of the decimal point is in the thousandths place. The number in the hundredths place increases by 1 when the number in the thousandths place is 5 or greater. The number in the hundredths place remains the same if the number in the thousandths place is less than 5. Since the number in the thousandths place is less than 5, the number 0.8637 should be rounded down to 0.860. Choice B is incorrect. The number 0.863 is 0.8637 truncated to the thousandths place instead of rounded to the nearest hundredth. Choice C is incorrect. The number 0.864 is 0.8637 rounded to the nearest thousandths place instead of rounded to the nearest hundredth. Choice D is incorrect. The number 0.87 is 0.8637 rounded up to the nearest hundredth, but since the number in the thousandths place is less than 5, the number should be rounded down.
- 17. Choice D is correct.** Dividing 30 by 60%, which is equivalent to 0.60, gives 50. So 60% of 50 is 30. Choices A and B are incorrect because 60% was not converted into a decimal, and in choice B the division was done in the wrong order. Choice C is incorrect because 30 was multiplied by 0.60 instead of divided.
- 18. Choice D is correct.** The expression  $\frac{4}{3} \div \frac{1}{6} = \frac{4}{3} \times 6 = \frac{24}{3} = 8$ . The number 8 is between 7 and 9. Choices A, B, and C are incorrect. The quotient of the two given fractions is not between any of these pairs of numbers.



**19. Choice C is correct.** The fraction  $\frac{5}{8}$  is greater than  $\frac{6}{10}$ . When using a common denominator, this statement is equivalent to  $\frac{25}{40} > \frac{24}{40}$ . When two fractions have common denominators, the fraction with the larger numerator is the larger number. Choice A is incorrect because  $\frac{3}{4}$  is not less than  $\frac{5}{7}$ . Shown written with a common denominator, the comparison  $\frac{21}{28} < \frac{20}{28}$  is not true. Choice B is incorrect because  $\frac{2}{3}$  is not greater than  $\frac{5}{6}$ . Shown written with a common denominator, the comparison  $\frac{4}{6} > \frac{5}{6}$  is not true. Choice D is incorrect because  $\frac{4}{5}$  is not less than  $\frac{2}{9}$ . Shown written with a common denominator, the comparison  $\frac{36}{45} < \frac{10}{45}$  is not true.

**20. Choice B is correct.** Carole worked  $\frac{1}{4}$  of the 28 days at the bookstore, so she worked 7 days at the bookstore ( $28 \times \frac{1}{4}$ ). She did not work on  $\frac{1}{14}$  of the days, which equals 2 days ( $28 \times \frac{1}{14}$ ). Subtracting these amounts from 28 gives the number of days she worked at the restaurant ( $28 - 7 - 2 = 19$ ). Choice A is incorrect and may be the result of erroneously adding  $\frac{1}{4}$  and  $\frac{1}{14}$  and finding  $\frac{2}{18}$  as the days not worked at the restaurant.  $28 - (28 \times \frac{2}{18}) = 25$ . Choice C is incorrect and may be the result of adding the denominators of the fractions ( $14 + 4$ ) and using this as the number of days Carole did not work at the restaurant.  $28 - 18 = 10$ . Choice D is incorrect because it is the total number of days Carole worked at the bookstore and the days she did not work.