

Fall 05 Algebra Evaluation

MTY Academy

Fall 05-Algebra

1. Perform the indicated operations. Write your final answers as mixed numbers. **SHOW YOUR WORK!**

$$(1) \quad -\frac{2}{15} \times \left(-\frac{20}{7}\right) \times \frac{3}{8}$$

$$(2) \quad -\frac{25}{15} - \left(-\frac{20}{3}\right) \div \frac{18}{3}$$

$$(3) \quad 3 \times \left(-\frac{5}{12}\right) - \left(-\frac{3}{2}\right) \times \left(-\frac{1}{6}\right)$$

$$(4) \quad \frac{2}{5} \div \frac{3}{14} \times \left(-3\frac{4}{7}\right)$$

$$(5) \quad -3\frac{2}{3} - \left(-1\frac{2}{5}\right) \times \left(3\frac{1}{3}\right)$$

$$(6) \quad -\left(\frac{3}{5}\right) \times \left(\frac{30}{9}\right) - \left(-2\frac{5}{4}\right) \div \frac{13}{2}$$

2. The sum of three even consecutive integers is 1272. What is the integer that is 15 less than the smallest even integers of the three consecutive even integers?

3. Find the average of $-12, 14, -56, 27, -23$ and 32 . Write your answer in simplest fraction form .

4. Write the average of $2x, -1 - 2x, -5x, 7, 3x + 1, 9$ and 2 in terms of x . Simplify your answer.

5. If the average of $4x + 2, -7, -2x + 1,$ and $-5x - 2$ is 15, what is the value of x ?

6. If the average of $x + 3, -9, -2x + 1,$ and $3x - 2$ is 25, what is the value of x ?

7. Amy made 19.5, 16, 17.5, 17, and 18.5 on her first five quizzes. How many points does she need on her next quiz so that she will have an average of 18 on all six quizzes? Is it possible? Give reasons to support your answer. (Assume that the total points on each quiz is 20 points.)

8. **Solve** each of the following equations. **Verify** your answers and finally **box** your solutions.

$$(1) \quad -\frac{5}{6}x = 2 - \frac{3}{12}x$$

$$(2) \quad -\frac{2}{5}x + \left(-\frac{1}{5}\right) = 2$$

$$(3) \quad \frac{2}{3} - \frac{1}{2}x = 3 - \frac{1}{3}x$$

9. Find a number such that 4 less than two-thirds the number is one-fourth the number.
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10. A jar contains red and blue balls. In all there are 100 balls. If the number of red balls is 1 more than four-fifths the blue balls, how many red balls are there in the jar?
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11. Let $\triangle ABC$ be an isosceles triangle with $AB = AC$. Assume that the length of AB is two-third of the length of BC and the average of the three lengths is $9\frac{1}{3}$ inches.

- (1) Draw triangle $\triangle ABC$ and label vertices of the triangle.
 - (2) Find the length of each side of the triangle.
 - (3) Find the perimeter of the triangle.
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12. Evaluate each of the following numbers. Show your work in detail.

$$(1) \quad -(-2)^5 - (-3)^4$$

$$(2) \quad \left(-\frac{1}{3}\right)^3 \times \left(-\frac{6}{4}\right)^2$$

13. Determine whether 345933 is divisible by 9, using the rules you learned from the class. Give reasons to support your answer.
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14. Let a be a decimal digit. Find all possible value(s) of a so that the integer $5912a$ is divisible by 3. Give reasons to support your answer.
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15. Let a and b be decimal digits. Find all possible value(s) of a and b so that the integer $19a2b$ is divisible by 9. Give reasons to support your answer.

16. Use a divisibility rule to determine whether each of the following numbers is divisible by 7. Show your work in detail.

(1) 652

(2) 15342

17. Use a divisibility rule to determine whether each of the following numbers is divisible by 11. Show your work.

(1) 2435634

(2) 15600651

18. Use a divisibility rule to determine whether 3561 is divisible by 13. Show your work.
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19. Given integers: 168 and 144

(1) find a factor tree for each number:

(2) find the prime factorization of 168:

(3) find the prime factorization of 144:

(4) find $GCF(168, 144)$.

(5) find $LCM(168, 144)$.

20. Use the division method to find each of the following.

(1) $GCF(72, 168)$

(2) $LCM(150, 240)$

21. Use the Euclidean method to $GCF(135, 240)$.
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22. For each of the following numbers, **FIND** its prime factorization and **DETERMINE** the number of all different factors.

(1) 590

(2) 2016

23. Write each of the following sentences as an inequality. Describe the variable in words in each of your inequality.

(1) The number of people in a classroom is between 25 and 50, inclusively.

(2) Wesley has at least seven red pens but no more than twenty red pens.

(3) The number is a positive integer not exceeding 50.

(4) Emily has at most 125 dollars.

24. **Solve** each of the following inequalities. **Graph** your solutions. **Write** the solution set in interval notation.

(1) $-4x - (-7) < -2x + (-6)$

(2) $2(x - 5) + 7 < 3x - (-3x) + 8$

(3) $\frac{3}{4}x - \frac{1}{2} \leq -1 - 2x$

25. For each pair of the following inequalities, graph the solution set on a number line and write the solution set in interval notation.

(1) $2 \leq 2x - 7$ or $2x < -12$

(2) $2 < 2x + 6$ and $4 - 2x \geq -8$

(3) $-4 < 3 - 2x \leq 5$

26. Five more than twice a number is at least -3 but no larger than 8. What is the range of this number?