Dear Math student,

We are very excited to have you in Math next year. In anticipation for next year’s class, enclosed you will find a review packet to complete over the summer. These are topics that we expect you to know before class begins. If you are struggling with the material attached is a list of websites that are excellent resources to take advantage of. Some of these websites includes videos and examples to assist you. Please show your work in a NEAT and ORGANIZED manner. **A test will be given pertaining to the review material within the first week of class.**

Good luck! We look forward to seeing you in the fall.

Happy Summer!

-WHS Mathematics Department
1. www.khanacademy.org


Accuplacer Elementary Algebra Study Guide

The following sample questions are similar to the format and content of questions on the Accuplacer Elementary Algebra test. Reviewing these samples will give you a good idea of how the test works and just what mathematical topics you may wish to review before taking the test itself. Our purposes in providing you with this information are to aid your memory and to help you do your best.

I. Order of operations

1. \(3^2 + 5 - \sqrt{4} + 4^6\)
2. \((5 + 1)(4 - 2) - 3\)
3. \(3 \cdot 7^3\)
4. \(2(7 + 3)^2\)
5. \(49 + 7 - 2 \cdot 2\)
6. \(9 + 3 \cdot 5 - 8 + 2 + 27\)
7. \(3 + 2(5) - | - 7|\)
8. \(\frac{5 \cdot 5 - 4(4)}{2^3 - 1}\)
9. \(4^3 - 5^2\)
10. \(-5^3\)

II. Scientific Notation

Write the following in Scientific Notation.

1. 350,000,000
2. 0.000000000000000523
3. 120,500,000,000,000,000,000,000

Write in expanded form.

4. \(6.02 \times 10^{23}\)
5. \(3.0 \times 10^9\)
6. \(1.819 \times 10^{-9}\)

Simplify. Write answers in scientific notation.

7. \((3 \times 10^3)(5 \times 10^8)\)
8. \((3 \times 10^{-4})^2\)
9. \(\frac{6 \times 10^9}{3 \times 10^4}\)
10. \(\frac{\left(3.2 \times 10^5\right)(2 \times 10^{-3})}{2 \times 10^{-5}}\)

III. Substitution

Find each value if \(x = 3\), \(y = -4\), and \(z = 2\).

1. \(xyz - 4z\)
2. \(2x - y\)
3. \(x(y - 3z)\)
4. \(\frac{5x - z}{xy}\)
5. \(3y^2 - 2x + 4z\)

IV. Linear equations in one variable

Solve the following for \(x\).

1. \(6x - 48 = 6\)
2. \(\frac{2}{3}x - 5 = x - 3\)
3. \(50 - x - (3x + 2) = 0\)
4. \(8 - 4(x - 1) = 2 + 3(4 - x)\)
V. Formulas
1. Solve \( PV = nRT \) for \( T \).
2. Solve \( y = 3x + 2 \) for \( x \).
3. Solve \( C = 2\pi r \) for \( r \).
4. Solve \( \frac{x}{2} + \frac{y}{5} = 1 \) for \( y \).
5. Solve \( y = \ln x - 4x \) for \( x \).

VI. Word Problems
1. One number is 5 more than twice another number. The sum of the numbers is 35. Find the numbers.
2. Ms. Jones invested \$18,000\) in two accounts. One account pays 6% simple interest and the other pays 8%. Her total interest for the year was \$1,290. How much did she have in each account?
3. How many liters of a 40% solution and an 16% solution must be mixed to obtain 20 liters of a 22% solution?
4. Sheila bought burgers and fries for her children and some friends. The burgers cost \$2.05 each and the fries are \$0.85 each. She bought a total of 14 items, for a total cost of \$19.10. How many of each did she buy?

VII. Inequalities
Solve and graph on the number line.
1. \( 2x - 7 \geq 3 \)
2. \( -5(2x + 3) < 2x - 3 \)
3. \( 3(x - 4) - (x + 1) \leq -12 \)

VIII. Exponents & Polynomials
Simplify and write answers with positive exponents.
1. \( (3x^2 - 5x - 6) + (5x^2 + 4x + 4) \)
2. \( \frac{(2a^{-3}b^2c^3)^2}{(3a^3b^{-7}c^3)^2} \)
3. \( 3x^0y^5z^6(2xy^3z^{-2}) \)
4. \( (-a^2b^7c^9)^4 \)
5. \( (4x^2y^6z^4)(x^{-2}y^3z^4)^6 \)
6. \( \frac{24x^4 - 32x^3 + 16x^2}{8x^2} \)
7. \( (x^2 - 5x)(2x^3 - 7) \)
8. \( \frac{26a^2b^{-3}c^6}{-4a^{-6}bc^6} \)
9. \( (5a + 3)^2 \)

IX. Factoring
1. \( x^2 + 5x - 6 \)
2. \( x^2 - 5x - 6 \)
3. \( 4x^2 - 36 \)
4. \( x^2 + 4 \)
5. \( 64x^4 - 4y^4 \)
6. \( 8x^2 - 27 \)
7. \( 49y^2 + 84y + 36 \)
8. \( 12x^2 + 12x + 3 \)
X. Quadratic Equations
1. \(4a^2 + 9a + 2 = 0\)
2. \(9x^2 - 81 = 0\)
3. \(25x^2 - 6 = 30\)
4. \(3x^2 - 5x - 2 = 0\)
5. \((3x + 2)^2 = 16\)
6. \(r^2 - 2r - 4 = 0\)

XI. Rational Expressions
Perform the following operations and simplify where possible. If given an equation, solve for the variable.
1. \(\frac{4}{2a - 2} + \frac{3a}{a^2 - a}\)
2. \(\frac{3}{x^2 - 1} - \frac{4}{x^2 + 3x + 2}\)
3. \(\frac{6x - 18}{3x^2 + 2x - 8} \cdot \frac{12x - 16}{4x - 12}\)
4. \(\frac{16 - x^2}{x^2 + 2x - 8} + \frac{x^2 - 2x - 8}{4 - x^2}\)
5. \(\frac{x^2 - 1}{x - 1}\)
6. \(\frac{2 - \frac{1}{x}}{\frac{1}{y}}\)
7. \(\frac{2}{x - 1} + \frac{1}{x + 1} = \frac{5}{4}\)
8. \(\frac{3}{k} + 1 = \frac{3 + k}{2k}\)
9. \(\frac{5 - x}{x} + \frac{3}{4} = \frac{7}{x}\)

XII. Graphing
Graph each equation on the coordinate axis.
1. \(3x - 2y = 6\)
2. \(x = -3\)
3. \(y = 2\)
4. \(y = \frac{-2}{3}x + 5\)
5. \(y = |x - 3|\)
6. \(y = -x^2 + 2\)
7. \(y = \sqrt{x + 2}\)
XIII. Systems of Equations
Solve the following systems of equations.

1. \[2x - 3y = -12\]
   \[x - 2y = -9\]

2. \[4x + 6y = 10\]
   \[2x + 3y = 5\]

3. \[x + 2y = 5\]
4. \[x + 2y = 7\]

\[2x - 3y = -4\]
\[y = -2x + 4\]

XIV. Radicals
Simplify the following using the rules of radicals (rationalize denominators). All variables represent positive numbers.

1. \[\sqrt[4]{8 \times 10}\]
2. \[\sqrt{\frac{81}{x}}\]
3. \[\sqrt[3]{4} \div \sqrt[3]{3}\]
4. \[\sqrt[2]{\frac{12}{18}} \times \sqrt[2]{\frac{15}{40}}\]
5. \[\sqrt[4]{24x^3 y^6}\]
6. \[2\sqrt{18} - 5\sqrt{32} + 7\sqrt{162}\]
7. \[\frac{3}{5 - \sqrt{3}}\]
8. \[\left(2\sqrt{3} + 5\sqrt{2}\right) \div \left(3\sqrt{3} - 4\sqrt{2}\right)\]

Practice:
1) Change \(4\frac{1}{6}\) to an improper fraction.
2) Change \(\frac{42}{16}\) to a mixed number.

3) \(\frac{5}{3} + 2\frac{2}{3}\)
4) \(\frac{5}{2} + 3\frac{2}{3}\)
5) \(\frac{9}{13} - 2\frac{1}{2}\)
6) \(\frac{10}{7} - 2\frac{3}{7}\)

7) \(\frac{3}{7} \times \frac{5}{9}\)
8) \(\frac{3}{7} \times \frac{7}{9}\)

9) \(\frac{6}{11} + 14\)
10) \(\frac{4}{5} + \frac{5}{6}\)
Practice:

11) \[
\frac{18.1 \times 0.04}{5.6}
\]

12) \[
0.97 \times 5.6
\]

13) \[
123 + 2.6 + 9.04 =
\]

14) \[
83.0097 + 124.9 + 9.043 =
\]

15) \[
0.07 - 0.002 =
\]

16) \[
96 - 0.3992 =
\]

17) \[
\frac{27.36}{4}
\]

18) \[
0.2601 \div 9 =
\]

19) \[
7.055 \div 0.83 =
\]

20) \[
\frac{4.466}{2.03}
\]

Practice:
Write the following in percent form.

21) \[
0.12
\]

22) \[
\frac{6}{8}
\]

23) \[
\frac{2}{5}
\]

24) \[
0.233
\]

25) \[
1.15
\]

26) What is 11% of $3,000?

27) 60 is what percent of 12,000?

28) 28 is 40% of what number?