# COLUMBIA COLLEGE

# Academic Upgrading Math Assessment Preparation Workbook

Grades 1 to 9

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8-19-2021

**Preparing for Math AT: Grades 4 and up**

Review the basics from grades 1 to 9 to make sure you can remember what you knew many years ago. Calculators are not allowed. If you have forgotten your times tables, you need to review them.

Work through as much of this Assessment Review Worksheet as you can. If you are stuck on one section, move onto the next section. In the Answers section at the end, there are suggestions of where you can go to review the things that you have forgotten.

1. Try these using a pencil and paper. It should take you less than 5 minutes. You can check your answers when you are done

a) 3456 + 387          b) 3876 – 645          c) 2030 – 27          d) 3000 - 107

e) 34 X 357

2. Next, do these. It should take less than one minute to get them all right.

2x6      4x9      6x7      8x5      9x3      5x6      10X5      8x4      3x4      6x8      9x5      5x7      4x6

3. Many students forget long division. Try these. It should take about 3 minutes.

a) 324 ÷ 4          b) 3576 ÷ 2          c) 243 ÷ 9          d) 2570 ÷ 10      e) 1875 ÷ 25

4. The biggest problem students usually have is fractions. Try these.

a) $\frac{3}{14} + \frac{6}{14}$          b) $\frac{9}{14} - \frac{6}{14}$          c) $\frac{7}{8} - \frac{3}{4}$          d) $\frac{3}{8} + \frac{1}{3}$          e) $\frac{9}{10} - \frac{6}{7}$

5. Multiplying and dividing fractions. Reduce (Simplify) your answers if you can.

a) $\frac{1}{2} X \frac{5}{6}$          b) $\frac{3}{5} X \frac{4}{9}$          c) $\frac{6}{14} \div \frac{5}{11}$      d) $\frac{3}{10} \div \frac{9}{14}$

6. This section looks at more complex fraction skills.

a) Reduce $\frac{6}{14}$                    b) Change to an improper fraction $5\frac{2}{9}$

c) Change to a mixed number $\dfrac{22}{3}$     d) Change to an improper fraction and reduce $6\dfrac{2}{4}$

e) $2\dfrac{2}{5} + 6\dfrac{1}{2}$     f) $2\dfrac{2}{5} \times 6\dfrac{1}{2}$     g) $2\dfrac{2}{5} \div 6\dfrac{1}{2}$

7. For this section on decimals, you should need under 5 minutes.

a) 3.7 + 6.78     b) 23.805 – 2.706     c) 3.14 X 8.03     d) 5 X 6.7

e) 16 X 0.5     f) 2.5 ÷ 5     g) 0.5 ÷ 0.05     h) 18 – 3.57

8. Integers

a) 5 – 22     b) -5 + 67     c) -3 -67     d) -6 + (-7)

e) (-5)(-8)     f) 15 X (-5)     g) -3 – (-8)     h) -93 ÷ 3

9. Substitution and Order of Operations

a) If n = 5 and k = 8, what is 3k -2n + nk ?

10. Algebra. Solve for n

a) 2n = 20     b) 2n – 7 = 21     c) 80 = 4n + 20     d) 3n + 11 = 2n + 26

f) 2 (3n -2) = 20

11. Polynomials. Simplify these

a) 2n + 76 – 3n + 8 + 5n     b) 3(2n + 8)     c) 2 (2n – 6) + 14

12. Percentages and ratios.

a) Change 4% to a decimal     b) Change $\dfrac{7}{20}$ to a percent     c) Change 25.8% to a decimal

d) What is 25% of 160?     e) 16 is what percent of 80?     f) Solve $\dfrac{x}{24} = \dfrac{8}{20}$
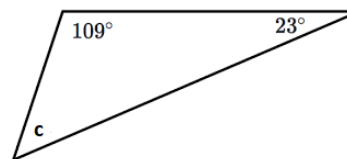
13. Exponents. Simplify these

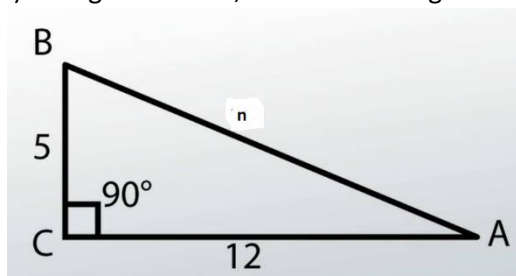a) $6^3$     b) $m^2 + m^2$     c) $(m^2)(m^3)$     d) $m^8 \div m^5$

14. Geometry

a) What is the area of circle whose radius is 4cm?  Use π=3.14 and Area = $πr^2$

b) In this triangle, what is the measure of Angle C?



c) Using $a^2 + b^2 = c^2$, What is the length of side n?



d) What is the area of the triangle shown above?

15.  Mean, Mode Median

Using this list of numbers, answer the questions:  12   3   6   20   8   3

a)  What is the mean?              b) What is the mode?              c) What is the median?

## ANSWERS

All students should be able to add, subtract, multiply and divide without a calculator.  If you have forgotten your times tables, you need to review them.

1.  Try these using a pencil and paper.  It should take you less than 5 minutes.  You can check your answers when you are done

a) 3456 + 387              b) 3876 – 645              c) 2030 – 27              d) 3000 - 107

3843                              3231                              2003                              2893

e) 34 X 357

12138

If you made mistakes in the adding and subtracting, go to mathantics.com and review Algorithms Part 1

2.  Next, do these.  It should take less than one minute to get them all right.

| 2x6 | 4x9 | 6x7 | 8x5 | 9x3 | 5x6 | 10X5 | 8x4 | 3x4 | 6x8 | 9x5 | 5x7 | 4x6 |
|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|
| 12  | 36  | 42  | 40  | 27  | 30  | 50   | 32  | 12  | 48  | 45  | 35  | 24  |

If you were slow or forgot any of these, go to www.multiplication.com/games/play/quick-flash-ii  and start with 2.  Move through the numbers until you are fast and do not even need to think to get the right

answers. You may have to repeat some steps many times, but this is an essential skill for all math above grade 4.

3. Many students forget long division. Try these. It should take about 3 minutes.

a) 324 ÷ 4          b) 3576 ÷ 2          c) 243 ÷ 9          d) 2570 ÷ 10          e) 1875 ÷ 25

81                  1788                27                  257                  75

If you made mistakes go to mathantics.com and review Algorithms Part 2

4. The biggest problem students usually have is fractions. Try these.

a) $\frac{3}{14} + \frac{6}{14}$          b) $\frac{9}{14} - \frac{6}{14}$          c) $\frac{7}{8} - \frac{3}{4}$          d) $\frac{3}{8} + \frac{1}{3}$          e) $\frac{9}{10} - \frac{6}{7}$

9/14                    3/14                    1/8                    17/24                    3/70

If you made mistakes, go to mathantics.com and review Fraction Arithmetic

5. Multiplying and dividing fractions. Reduce (Simplify) your answers if you can.

a) $\frac{1}{2} \times \frac{5}{6}$          b) $\frac{3}{5} \times \frac{4}{9}$          c) $\frac{6}{14} \div \frac{5}{11}$          d) $\frac{3}{10} \div \frac{9}{14}$

5/12                    12/45                    33/35 (66/70 is not reduced)          7/15 (42/90 and 21/45 are not reduced fully)

If you made mistakes, go to mathantics.com and review Fraction Arithmetic

6. This section looks at more complex fraction skills.

a) Reduce $\frac{6}{14}$          b) Change to an improper fraction $5\frac{2}{9}$

3/7                                              47/9

c) Change to a mixed number $\frac{22}{3}$          d) Change to an improper fraction and reduce $6\frac{2}{4}$

$7\frac{1}{3}$                                              13/2

e) $2\frac{2}{5} + 6\frac{1}{2}$          f) $2\frac{2}{5} \times 6\frac{1}{2}$          g) $2\frac{2}{5} \div 6\frac{1}{2}$

$8\frac{9}{10}$                    78/5                    24/65

If you made mistakes, go to mathantics.com and review Mixed Numbers and Fractions sections

7. For this section on decimals, you should need under 5 minutes.

a) 3.7 + 6.78

b) 23.805 – 2.706

c) 3.14 X 8.03

d) 5 X 6.7

10.48

21.099

25.2142

33.5

e) 16 X 0.5

f) 2.5 ÷ 5

g) 0.5 ÷ 0.05

h) 18 – 3.57

8 or 8.0

0.5

10

14.43

If you made mistakes, go to mathantics.com and review Algorithms Part 2 in the Decimals Arithmetic lesson.

8. Integers

a) 5 – 22

b) -5 + 67

c) -3 -67

d) -6 + (-7)

-17

62

-70

-13

e) (-5)(-8)

f) 15 X (-5)

g) -3 – (-8)

h) -93 ÷ 3

40

-75

5

-31

If you made mistakes, go to mathantics.com and review Integer Arithmetic

9. Substitution and Order of Operations

a) If n = 5 and k = 8, what is 3k -2n + nk ?

54

If you made mistakes, go to mathantics.com and review the Arithmetic Section, Order of Operations Lesson

10. Algebra. Solve for n

a) 2n = 20

b) 2n – 7 = 21

c) 80 = 4n + 20

d) 3n + 11 = 2n + 26

10

14

15

15

f) 2 (3n -2) = 20

4

If you made mistakes, go to mathantics.com and review Algebra Basics Part 1

11. Polynomials. Simplify these

a) 2n + 76 – 3n + 8 + 5n

b) 3(2n + 8)

c) 2 (2n – 6) + 14

4n+84

6n+24

4n+2

If you made mistakes, go to mathantics.com and review Algebra Basics Part 2

12. Percentages and ratios.

a) Change 4% to a decimal

b) Change $\dfrac{7}{20}$ to a percent

c) Change 25.8% to a decimal

<span style="color:red">0.04</span>          <span style="color:red">35%</span>          <span style="color:red">0.258</span>

d)  What is 25% of 160?          e)  16 is what percent of 80?     f) Solve $\dfrac{x}{24} = \dfrac{8}{20}$

<span style="color:red">40</span>          <span style="color:red">20</span>          <span style="color:red">9.6  or $9\frac{3}{5}$</span>

<span style="color:red">If you made mistakes, go to mathantics.com and review Percentages and Ratios & Proportions</span>

13.  Exponents.  Simplify these

a)  $6^3$          b)  $m^2 + m^2$          c)  $(m^2)(m^3)$          d)  $m^8 \div m^5$

<span style="color:red">216          2m$^2$          m$^5$          m$^3$</span>

<span style="color:red">If you made mistakes, go to mathantics.com and review Exponents section and Algebra Basics Part 2 section, Exponents Lessons</span>
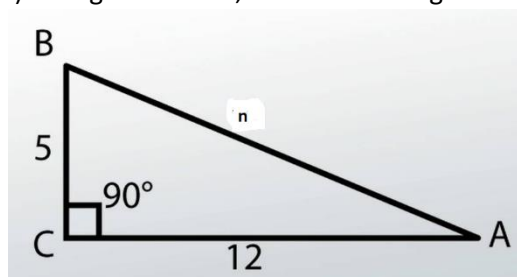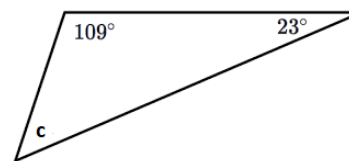
14.  Geometry

a)  What is the area of circle whose radius is 4cm?  Use π=3.14 and Area = $\pi r^2$

<span style="color:red">50.24cm$^2$</span>

b)  In this triangle, what is the measure of Angle C?
<span style="color:red">48°</span>

c)  Using $a^2 + b^2 = c^2$, What is the length of side n?

<span style="color:red">13</span>

d) What is the area of the triangle shown above?

<span style="color:red">30</span>

<span style="color:red">If you made mistakes, go to mathantics.com and review Geometry Part 1 and Geometry Part 2</span>

15.  Mean, Mode Median

Using this list of numbers, answer the questions:  12   3   6   20   8   3

a)  What is the mean?          b) What is the mode?          c) What is the median?

<span style="color:red">$8.\overline{6}$  or $8\frac{2}{3}$          3          7</span>

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Document Name: Academic Upgrading Math Assessment Preparation Workbook
Document Number: SS-P009
Revision #1          NOTE:  Revisions to this document can be made following procedures outlined in Document #ADM-P014 – Document Control Policy and Procedures
Revision Date: August 20, 2021
Approved by: Tom Snell
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If you made mistakes, go to mathantics.com and review Statistics section, Mean, Median and Mode sections.

More videos and help can be found at Khan Academy online.  Simply do a Google search for the topic with the word "Khan" in front of it…  For example  *Khan median*  or *Khan long division*

This review covers most things on the AU Lower Assessment Test for placement in grades 1 to 9.  If you can get close to 100% on the Assessment, you may be eligible for Grade 10C.  The AU Upper Assessment requires you to know the contents of Math 10C as a minimum.

https://ca.ixl.com/standards/alberta/math/grade-10 will help students remember the important sections in Math 10C.

https://ca.ixl.com/standards/alberta/math/grade-11 has information on Math 20-2 and 20-1.