Required knowledge of elementary mathematics and English for the GMAT preparation course

Required knowledge of elementary mathematics
We have found that many prospective candidates struggle with elementary mathematics. Naturally, the lecturers will keep in mind that not everyone is a mathematician, but even so, we highly recommend that participants ensure that they have a reasonably sound understanding of elementary mathematics before they take the course. This will allow them to focus fully on the GMAT questions during the course. At the very least, participants must have experience of the following subjects:

Numbers
- Integer arithmetic
  - Addition, subtraction and multiplication
- Fractions
  - Adding and subtracting fractions
  - Multiplying and dividing fractions
- Exponents and roots of numbers
  - Integer exponents
  - Roots of whole numbers
  - Roots of fractions
  - Fractional exponents

Algebra
- Algebra (using letters to stand for numbers)
  - Order of operations
  - Laws of exponents
  - Expanding (removing parentheses)
  - Factoring
- Fractions in algebra
  - Simplifying fractions

Equations
- Linear equations
  - Solving equations
  - Inequalities
- Quadratic equations
  - Quadratic equations
- Systems of linear equations (recommended, but not absolutely required)
  - Two equations with two unknowns

Geometry
- Lines in a coordinate plane
  - Equation of a straight line (slope and intercept)
Basic test
Complete this basic test if you are unsure about your basic level or want to make sure that it is sufficient. If you are able to answer the test questions without too much trouble, your basic level is good enough to take part in the course.

Questions:

Fractions
Write the following expressions as a single fraction without using a calculator.

1a. \( \frac{1}{5} + \frac{3}{5} \)

1b. \( \frac{2}{3} \times \frac{3}{4} \)

1c. \( \frac{5}{7} + \frac{3}{5} \)

1d. \( \frac{3}{5} + 2 \)

1e. \( 5 \times \frac{3}{16} \)

1f. \( \frac{2}{a} + \frac{8}{a} \) with \( a \neq 0 \)

1g. \( \frac{a}{2} \times \frac{b}{7} \)

1h. \( \frac{1}{2} + \frac{1}{3} \)

Brackets
Write the following expressions without brackets and simplify without using a calculator.

2a. \( 3 \times (5 + 4) \)

2b. \( (3 - 5)(5 - 6) \)

2c. \( 3 - (a - 9) \)

2d. \( 2(a + b) \)

2e. \( (a + b)(a + b) \)

Powers and Roots
Calculate the following without using a calculator.

3a. \( \sqrt{64} \)

3b. \( 2^6 \)

3c. \( 3^{-3} \times 3^5 \)

3d. \( \frac{\sqrt{23}}{3^{20}} \)

3e. \( a^0 \) with \( a \neq 0 \)
Solving Equations
Solve the following equations for $x$.

4a. $3x + 5 = 17$
4b. $3x^2 = 27$ \textit{Hint: there are two solutions.}
4c. $(x + 5)(x - 7) = 0$ \textit{Hint: there are two solutions.}
4d. $\frac{2x}{3} = 6$
4e. $2x^3 = 16$

Linear Functions
Draw the following lines in the $xy$-plane.

5a. $y = 2x + 1$
5b. $y = 4$

Extra
6a. Consider the following equation:

$$2x + 4y = 6$$

What is $x$ in terms of $y$?

6b. Solve the following inequality for $x$:

$$-3x + 2 > 11$$

Geometry
7a. The sum of the angles A, B and C in Triangle ABC =

7b. If circle C has a radius $r=2\pi$, what is the area of C?

7c. If circle C has a radius $r=2\pi$, what is the circumference of C?
Answers:

Fractions
Write the following expressions as a single fraction without using a calculator.

1i. \( \frac{4}{5} \)  
1m. \( \frac{15}{16} \)
1j. \( \frac{6}{12} (= \frac{1}{2}) \)  
1n. \( \frac{7}{a} \)
1k. \( \frac{45}{55} \)  
1o. \( \frac{ab}{14} \)
1l. \( \frac{3}{10} \)  
1p. \( \frac{3}{2} \)

Brackets
Write the following expressions without brackets and simplify without using a calculator.

2f. \( 27 \)
2g. \( 2 \)
2h. \( 12 - a \)
2i. \( 2a + 2b \)
2j. \( a^2 + 2ab + b^2 \)

Powers and Roots
Calculate the following without using a calculator.

3f. \( 8 \)
3g. \( 64 \)
3h. \( 9 \)
3i. \( 27 \)
3j. \( 1 \)

Solving Equations
Solve the following equations for \( x \).

4f. \( x = 4 \)
4g. \( x = 3 \) or \( x = -3 \)
4h. \( x = -5 \) or \( x = 7 \)
4i. \( x = 9 \)
4j. \( x = 2 \)

Linear Functions
5a. \( + 5b \).
Geometry
7a. Angles in each triangle are 180 degrees summed
7b. $4\pi^3$
7c. $4\pi^2$

Advice if you need more preparation
If you feel that your mathematics needs some brushing up, read the tips below to help you improve your mathematics skills ahead of the GMAT preparation course.

1. Buy the 'Basisboek Wiskunde' textbook (a blue book with a red cube on the cover) and immerse yourself in the aforementioned subjects.
2. Alternatively, you can buy 'Getal en ruimte', the geometry textbook used at Dutch pre-university secondary schools. Be aware that you do not need to know everything in these books to sit the GMAT, so find the subjects listed above in these textbooks and make sure that you study them.
3. In addition, you may consider taking a mathematics refresher course, such as those offered by WeTeach (www.weteach.nl).

Extra
6a. $x = 3 - 2y$
6b. $x < -3$
**Required knowledge of elementary English**

The GMAT preparation course is designed to ensure that you are well prepared for the GMAT. This includes making sure that your English is good enough to pass the test. You will definitely need to be fluent in English to be able to pass the GMAT. Since the preparation course will only last ten weeks, you will need to be reasonably fluent in English before the start of the course in order to complete the course successfully.

How do you know whether your basic level is good enough? Complete the basic test below to establish the level of your English. This basic test consists of the following:

1. An old pre-university English exam (with answers and marking)
2. An online test to compare your level with the Common European Framework of Reference for language skills
3. An example of the type of text that you will encounter in the GMAT assignments, which will help you find out whether your English vocabulary is extensive enough to answer the reading comprehension questions

If your English is not at the required basic level, check out our comprehensive list of materials (online courses and books) that will help you prepare for the GMAT preparation course in August.

**Basic test**

Complete the following three tests to find out whether your English is good enough to take the GMAT preparation course. Your score after each test will give an indication of the level of your English (A, B, C or D). Once you have completed all three tests, you will be given advice on how to proceed for each category.

1. **Pre-university exam**

   Complete the 2010 pre-university exam (second period). You will find the assignment booklet and text booklet for this exam at:

   [http://www.cito.nl/static/ce/ex2010_havovwo/vwo-tv2.htm](http://www.cito.nl/static/ce/ex2010_havovwo/vwo-tv2.htm)

   Here, you will also find the scoring instructions, so you can mark the exam yourself.

   *Levels* You can obtain a total of 52 points for this exam. The level indication for each score is given below.

   - Under 20: A
   - Between 18 and 29: B
   - Between 29 and 40: C
   - Over 40: D

2. **Online level test**

   Visit [http://www.englishtag.com/tests/tests.asp](http://www.englishtag.com/tests/tests.asp) to complete the tests for B1 and B2. Once you have given the answers, click on 'Continue' to view the test result straight away. Note: some components require you to drag and drop the answer to the correct slot (it is not enough to click on the right one).
Levels
You can obtain a total of 54 points for the B1 test and 35 for the B2 test.

<table>
<thead>
<tr>
<th>B1 test score</th>
<th>B2 test score</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 25</td>
<td>Under 20</td>
<td>A</td>
</tr>
<tr>
<td>Between 25 and 35</td>
<td>Between 20 and 25</td>
<td>B</td>
</tr>
<tr>
<td>Between 43 and 49</td>
<td>Between 25 and 30</td>
<td>C</td>
</tr>
<tr>
<td>Over 49</td>
<td>Over 30</td>
<td>D</td>
</tr>
</tbody>
</table>

3. **GMAT excerpt**

Read the text below and select the correct meaning of the underlined words.

When Jamaican-born social activist Marcus Garvey came to the United States in 1916, he arrived at precisely the right historical moment. What made the moment right was the return of African American soldiers from the First World War in 1918, which created an ideal constituency for someone with Garvey’s message of unity, pride, and improved conditions for African American communities.

Hoping to participate in the traditional American ethos of individual success, many African American people entered the armed forces with enthusiasm, only to find themselves segregated from white troops and subjected to numerous indignities. They returned to a United States that was as segregated as it had been before the war.

Considering similar experiences, anthropologist Anthony F. C. Wallace has argued that when a perceptible gap arises between a culture’s expectations and the reality of that culture, the resulting tension can inspire a revitalization movement: an organized, conscious effort to construct a culture that fulfills longstanding expectations.

Some scholars have argued that Garvey created the consciousness from which he built, in the 1920s, the largest revitalization movement in African American history. But such an argument only tends to obscure the consciousness of identity, strength, and sense of history that already existed in the African American community. Garvey did not create this consciousness; rather, he gave this consciousness its political expression.


i) **Constituency**
   a. de grondwet
   b. de constitutie
   c. achterban
   d. omstandigheid

ii) **Ethos**
   a. Karakter
   b. Grondhouding
   c. Ethiek
   d. Voorkeur

iii) **Entered the armed forces**
a. vielen de strijdkrachten aan  
b. namen dienst  
c. ontvingen de soldaten  
d. bundelden de krachten

iv) To find themselves segregated  
a. om erachter dat komen dat er rassenscheiding toegepast was  
b. om zichzelf in de segregatie te vinden  
c. om van mening te zijn dat ze gescheiden waren  
d. om zichzelf in afzondering te hervinden

v) subjected to numerous indignities  
a. het onderwerp van onduidelijke nummering  
b. het onderwerp van onduidelijke aantallen  
c. onderworpen aan talrijke beledigingen  
d. onder de hoede van talrijke officieren

vi) A perceptible gap  
a. een flink gat  
b. een nauwelijks waar te nemen kloof  
c. een zichtbare kloof  
d. een percentueel gat

vii) Revitalization  
a. Verlevendiging  
b. Herstructurering  
c. Verjonging  
d. Herwaardering

viii) Conscious  
a. Serieus  
b. Gewetenloos  
c. Bewust  
d. Consciëntieus

ix) Fulfill  
a. Volgooien  
b. Vervullen  
c. Logenstraffen
d. Uitlokken

x) Tends to obscure
   a. lijkt obscuur
   b. in de wielen rijden
   c. laat onduidelijk
   d. bevestigt

xi) Sense
   a. Gevoel
   b. Geur
   c. Zin
   d. Idee

xii) Political expression
   a. politieke vooringenomenheid
   b. politieke uitdrukking
   c. een gebaar van politici
   d. uitdrukking van beleefdheid.

You will find the answer key at the end of this document.

Level: There are 12 questions in total. The level indication for each score is given below.

- Under 5: A
- Between 5 and 7: B
- Between 7 and 10: C
- Over 10: D
Advice for each level category

Category A: Your English is far from good enough to pass the GMAT test. We are sorry, but there is little point in you taking the preparation course at this stage.

Category B: Right now, your English is not quite good enough to take the GMAT preparation course. You should prepare thoroughly by studying the materials below.

Category C: While your basic level of English is good, you ought to keep practising.

Category D: Your English is fine, but keep reading and speaking English to retain this level.

If you feel that your English needs some brushing up, read the tips below.

1. Study an easy-to-understand website on English grammar, such as http://www.taaldok.nl/engels/
2. Read a book on the basic grammar of the English language. If you are at Level B, you may wish to buy a Dutch textbook on English grammar. If you are at Level C or D, you should probably buy an English textbook on English grammar for added practice (such as English Grammar for Dummies).
3. The best way to improve your English is to read many English publications, listen to native English speakers, and particularly write and speak English whenever you can. For instance, read one small article on The Economist or The Wall Street Journal’s website every day and look up the words that you do not know.
4. Make sure to have an online dictionary at hand, such as www.dictionary.com (this website also has a handy app that you can use on your smartphone).
5. Consider using a textbook featuring exercises if you want to focus on increasing your English vocabulary (e.g. English Vocabulary in Use: Upper-Intermediate), or, alternatively, you can start using the many GMAT idiom or GMAT vocabulary lists that can be found on the Internet.

Answer key for the GMAT excerpt

i) C
ii) B
iii) B
iv) A
v) C
vi) A
vii) D
viii) C
ix) B
x) C
xi) D
xii) B