



Mathematical Methods

Unit 3 & 4

Pre-Test feedback and recommendations

Is Year 12 Mathematical Methods the right choice for you?

The Mathematical Methods pre-test is to help you understand what is expected in Year 12 Mathematical Methods, we would like you to do a pre-test.

1. Attempt the pre-test.
2. Correct your answers and work out your score.
3. See what we recommend on the last page.



MATHEMATICAL METHODS
UNITS 3 and 4
PRETEST

MULTIPLE CHOICE QUESTIONS

Select the correct answer. Each question is worth 1 mark.

Each question should be solved by hand, without the use of technology

1. For the function $f(x) = x^3 - 2x$

$$f(2) =$$

- A** 2 **B** 12 **C** 4 **D** 6

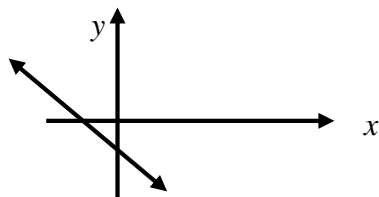
2. For the function $f(x) = x^2 + 5x$

$$f(-1) =$$

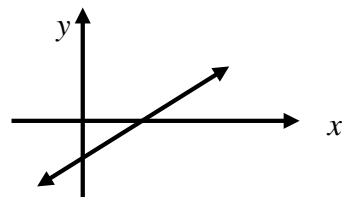
- A** -3 **B** -4 **C** -6 **D** -7

3. Which one of the following could be the graph of $2x - 3y = 6$?

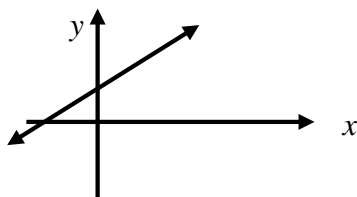
A



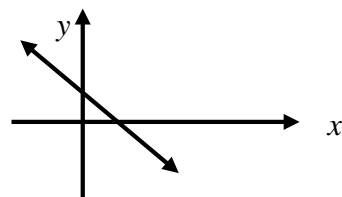
B



C



D



4. Which of the following set of ordered pairs is represented on the number plane by collinear points (in the same straight line)?

- A** $\{(1, 2), (1, 3), (2, 4)\}$
B $\{(3, 4), (1, 2), (5, 6)\}$
C $\{(3, 4), (-1, 3), (5, 6)\}$
D $\{(2, 1), (2, 2), (3, 1)\}$

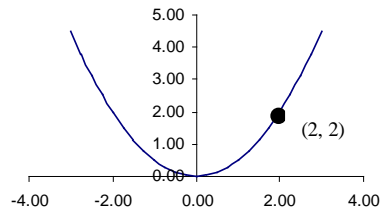


5. If you solve the equations below simultaneously
 $x = 2y$
 $x + 2y = 6$ the solutions are:
- A** $x = 3$
 $y = 1.5$
- B** $x = 3$
 $y = 6$
- C** $x = 2$
 $y = 3$
- D** $x = 3$
 $y = 3$
6. The expression $4 + 3[2x - (2 - 3x)]$ simplifies to
- A** $15(1 + x) - 13$
- B** $3\left[1 + 2x - \left(\frac{5}{3} - x\right)\right]$
- C** $2x + 5(3 - 2x)$
- D** $6x - 3x\left(\frac{2}{3x} + 3\right)$
7. The expression: $(7 - 3a)(3 + 4a)$ can be expanded to:
- A** $9a - 28a - 12a^2 + 21$
- B** $12a^2 - 9a + 28a + 21$
- C** $21 - 9a - 12a^2 + 28a$
- D** $9a - 12a^2 + 28a + 21$
8. Transpose the expression $w^2 = \frac{2x}{3} + 1$ to make x the subject.
The correct transposed expression is:
- A** $x = \frac{3}{2}(w-1)\left(w + \frac{1}{2}\right)$
- B** $x = \frac{3w^2 - 1}{2}$
- C** $x = \frac{3}{2}(w-1)(w+1)$
- D** $x = 3w^2 - \frac{1}{2}$
9. The expression $\frac{x^2y}{xz^2 - y}$ when $x = 2$, $y = -2$, and $z = 3$ is equal to
- A** $\frac{16}{20} - 2$
- B** 2.5
- C** -0.4
- D** $1 - \frac{4}{5}$

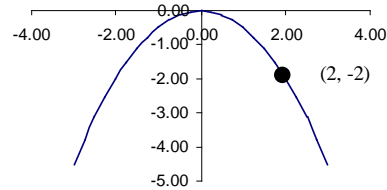


10. Which one of the following graphs is described by $y = \frac{1}{2}(-x)^2 + 1$?

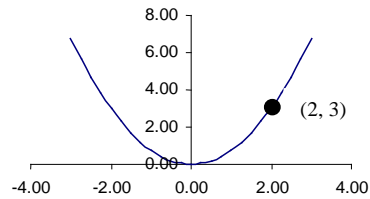
A



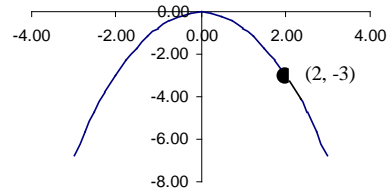
B



C



D



11. The expression $\left(\frac{5x}{3} - 1\right)(x - 3)$ can be re-expressed as:

A $6x - 3 + \frac{5x^2}{3}$

B $\frac{5x^2 - 6x + 9}{3}$

C $-6x - \frac{5x^2}{3} + 3$

D $\frac{1}{3}(5x^2 - 18x + 9)$

12. The expression $\left(\frac{2x}{3} - 1\right)^2$ can be re-expressed as:

A $\frac{1}{3}\left(3 - 12x + \frac{4x^2}{3}\right)$

B $1 - \frac{4x}{3} - \frac{4x^2}{9}$

C $1 - \frac{4x}{3} + \frac{4x^2}{9}$

D $1 - \frac{4x - 4x^2}{3}$

13. The expression $2x^2 - 7x - 4$ can be expressed as:

A $\frac{1}{2}(2x+1)(2x-4)$

B $2\left(x + \frac{1}{2}\right)(2x-4)$

C $\frac{1}{2}(4x+2)(x-4)$

D $(x+2)\left(\frac{x-8}{2}\right)$

14. If $p = \frac{1}{x}$ and $q = \frac{1}{2x}$, then $p + q$ equals
- A** $\frac{2x}{x^2+1}$ **B** $\frac{2x+1}{2x}$
- C** $\frac{3}{2x}$ **D** $\frac{x^2+1}{2x}$
15. If $x = \frac{1}{u+v}$ and $y = \frac{1}{u-v}$ then $x - y$ is equal to
- A** $\frac{2v}{u^2-v^2}$ **B** $\frac{-2v}{u^2-v^2}$
- C** $\frac{2u}{u^2-v^2}$ **D** $\frac{2uv}{u^2-v^2}$
16. The expression $\frac{a^2b}{2} + 2ab^2$ can be factorised to:
- A** $2ab\left(\frac{a}{2} + 2b\right)$ **B** $\frac{1}{2}(a+b)(2+b)$
- C** $a^2b^2\left(\frac{1}{2a} + \frac{2}{ab}\right)$ **D** $2ab\left(\frac{1}{4}a+b\right)$



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ANSWER SHEET

Multiple choice answers

- | | | | | | |
|-------|-------|-------|-------|-------|-------|
| 1. C | 2. B | 3. B | 4. B | 5. A | 6. D |
| 7. C | 8. C | 9. C | 10. C | 11. D | 12. C |
| 13. C | 14. C | 15. B | 16. D | | |

Your pre-test result... What we recommend ...

If your score was less than $\frac{8}{16}$

You will most likely need a lot of time and support for Year 12 Mathematical Methods. Students scoring less than 8 out of 16 tend to find the subject too difficult. We strongly recommend that you contact the Mathematical Methods teachers to discuss your options.

You will benefit from revision support throughout the year to develop the skills expected. This means making extra time available for your studies. Please contact the Mathematical Methods teachers to discuss your options.

If your score was between $\frac{9}{16}$ and $\frac{12}{16}$

If your score was between $\frac{13}{16}$ and $\frac{16}{16}$

You should be able to learn most of the mathematical skills expected. It is still important to make regular study time a part of your weekly schedule. If you have any concerns, contact VSV and speak to the Mathematical Methods teachers.