

Department of Economics University of Western Ontario Mathematics for EC 2100 Required Courses

Introduction

The Self-Assessment Multiple Choice Quiz 1 (EC 2100 required courses) will help you assess and review your mathematics skills to prepare you for taking the required EC 2100 intermediate courses.

This quiz does not aim to provide a complete list of examples of the math skills required to do well in the intermediate economics courses. All questions in this quiz may not be relevant for a specific course. However, this quiz should give you a good idea of how prepared you are, as it will provide you with a score and recommendations for how to continue to improve your math skills.

Instructions

This test contains 25 multiple choice questions. Select the correct answer by clicking on the button to the left. After answering all of the questions, click the feedback box at the bottom to see how many of your answers are correct and to receive feedback.

If you do not know how to solve a question, please choose the option “**I don’t know**” rather than guessing a multiple-choice answer randomly. This strategy will provide you with a more accurate self-assessment of your math skills.

Math Self-Assessment Quiz 2

After completing the Self-Assessment Multiple Choice Quiz 1, please review thoroughly the math materials where you may have a weakness. Then you can test your math skills again using the Self-Assessment Multiple Choice Quiz 2 designed for the required EC 2100 intermediate economics courses.

Notes

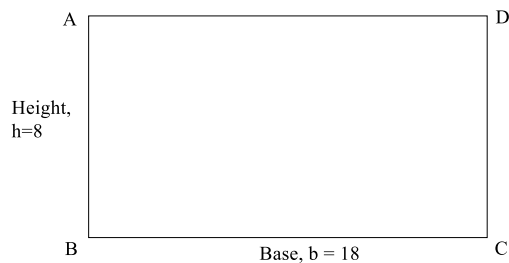
We welcome comments and suggestions. Please direct any errors, confusion and (or) suggestions about this quiz to Iftekher Hossain (mhossa87@uwo.ca). The quiz is copyrighted. No part of the quiz may be reproduced or published in any other form without the prior written permission from the Department of Economics, University of Western Ontario.

Math preliminaries (Question 1 – Question 4)

1. Simplify $\frac{x^{-0.5}y^{0.5}}{x^{0.5}y^{-0.5}}$

- a) $\frac{x}{y}$
 - b) -1
 - c) 1
 - d) $\frac{y}{x}$
 - e) I don't know
2. If the value of x rises from 5 to 6, what is the percentage change?
- a) 20% rise
 - b) 20% fall
 - c) 16.66% rise
 - d) 16.66% fall
 - e) I don't know.
3. Calculate the area of the following rectangle ABCD.

Figure 1



- a) $b + h = 26$
- b) $2b + 2h = 52$
- c) $0.5 \times b \times h = 72$
- d) $b \times h = 144$
- e) I don't know

4. Solve for x if

$$60 - 2x = 28 + 2x$$

- a) 7
- b) 8
- c) 9
- d) 10
- e) I don't know

Linear equations: functions and graphs (Question 5 – Question 10)

5. What is the slope of the graph of $2y + 3x = 10$?

- a) -3
- b) 3
- c) -1.5
- d) 1.5
- e) I don't know

6. Which of the following functions is the steepest?

$$y = 10 + 2x$$

Equation (1)

$$y = 8 + 3x$$

Equation (2)

$$y = 6 - 4x$$

Equation (3)

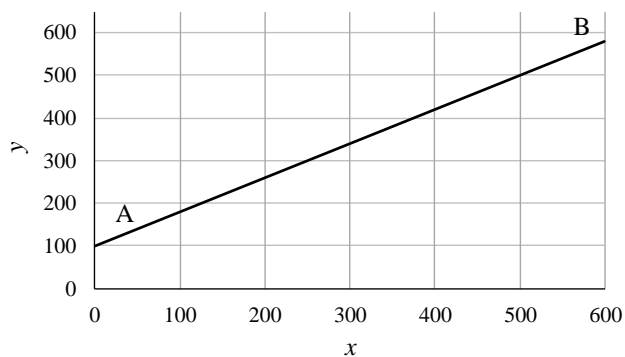
- a) Equation 1
- b) Equation 2
- c) Equation 3
- d) Equations 1 and 2
- e) I don't know

7. Given the function $f(x) = 2x + 6$, what is the x -intercept?

- a) $(0, -3)$
- b) $(-3, 0)$
- c) $(3, 0)$
- d) $(0, 3)$
- e) I don't know

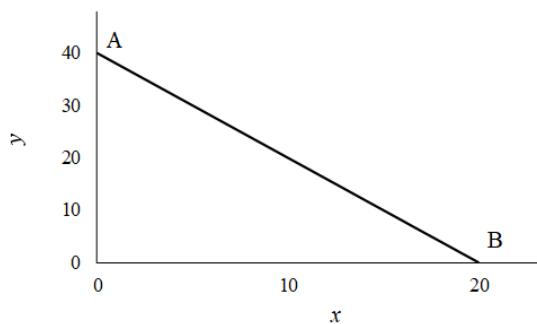
8. What is the equation of the line AB shown in Figure 2?

Figure 2



- a) $y = 100 + x$
 - b) $y = 100 + 0.8x$
 - c) $y = 100 + 0.5x$
 - d) $y = 100 + 2x$
 - e) I don't know
9. See the graph of the function in Figure 3. What is the equation of the line AB?

Figure 3



- a) $y = 40 - 20x$
- b) $y = 40 - 2x$
- c) $y = 40 - 0.5x$
- d) $y = -2x$
- e) I don't know.

- 10.** Given the function $f(x) = mx + c$. Identify the statement that is false
- a) An increase in c changes the intercept of the function but not the slope.
 - b) An increase in m changes the slope but not the intercept.
 - c) An increase in x increases the value of the function $f(x)$ given that the slope is positive.
 - d) A decrease in c changes the slope of the function.
 - e) I don't know.

Simultaneous equations (Question 11 – Question 14)

- 11.** Solve the following system of simultaneous equations:

$$y = -45 + 8x$$

$$y = 125 - 2x$$

- a) $x = 17, y = 91$
 - b) $x = 91, y = 17$
 - c) $x = 17, y = 17$
 - d) $x = 91, y = 91$
 - e) I don't know
- 12.** Solve the following system of simultaneous equations to find the value of y .

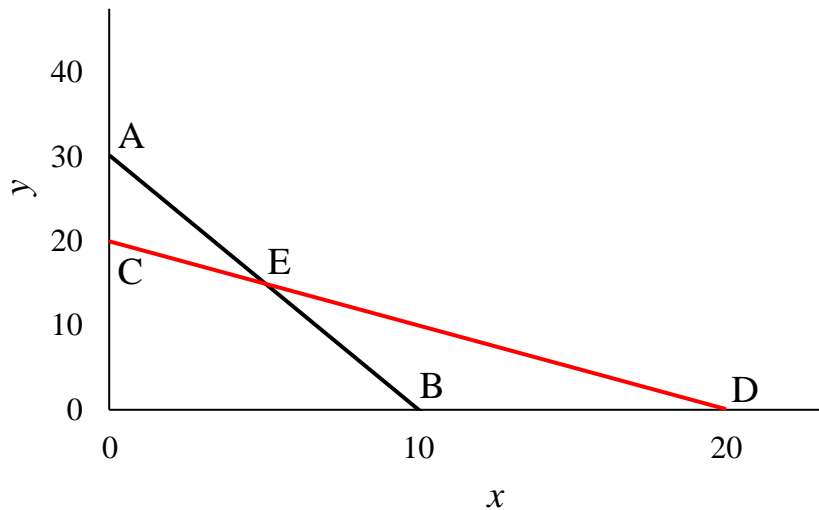
$$10x + 2y = 100$$

$$y = 5x$$

- a) $y = 10$
- b) $y = 20$
- c) $y = 25$
- d) $y = 50$
- e) I don't know

13. See Figure 4. Find the value of y at point E.

Figure 4



- a) 12
- b) 15
- c) 17
- d) 18
- e) I don't know

14. Two simultaneous equations are:

$$y = 400 - 15x + z$$
$$y = 5x$$

Find y when $z = 200$.

- a) 50
- b) 100
- c) 150
- d) 200
- e) I don't know.

Rules of differentiation (Question 15 –Question 18)

15. Find the derivative of the following function at an arbitrary point.

$$f(x) = 32x - x^2$$

- a) $32 - x$
- b) $32x - 2x^2$
- c) $32 - 2x$
- d) $32 - x^2$
- e) I don't know

16. Find the derivative of the following function at an arbitrary point.

$$f(x) = x^{0.5}$$

- a) $0.5x^{0.5}$
- b) $x^{-0.5}$
- c) $\frac{1}{2x^{0.5}}$
- d) $\frac{2}{x^{0.5}}$
- e) I don't know.

17. Find the second-order derivative of the following function:

$$f(x) = x^3 - 10x^2 + 40x + 40$$

- a) $3x^2 - 20x + 40$
- b) $6x - 20$
- c) 6
- d) $3x^2 - 20x$
- e) I don't know.

18. Find the slope of the following function at $x = 3$:

$$f(x) = 10x - x^2$$

- a) 4
- b) 10
- c) -4
- d) 7
- e) I don't know

Uses of the derivative (Question 19 –Question 25)

19. Is the following function increasing or decreasing in the immediate vicinity of $x = 2$?

$$y = 2x^2 - x^3$$

- a) Increasing
- b) Decreasing
- c) Stationary
- d) Cannot be determined
- e) I don't know

20. Consider a function defined by $y = \frac{k}{x}$, for all $x > 0$, where k is a constant. Test whether the function is a concave function.

- a) It is a convex function.
- b) It is a concave function.
- c) The function is initially concave and later convex.
- d) The function is neither convex nor concave.
- e) I don't know.

21. Consider a function defined by $f(x) = 10x - 2x^2$, for all $x > 0$. Test whether the function is a concave function.

- a) It is a convex function.
- b) It is a concave function.
- c) The function is neither convex nor concave.
- d) More information is required.
- e) I don't know.

22. At which value of x the following function is optimized?

$$f(x) = 50x - 2x^2$$

- a) $x = 312.5$
 - b) $x = 12.5$
 - c) $x = 20.5$
 - d) $x = -4$
 - e) I don't know
23. Suppose that $\frac{f(x)}{x} = 10 - 2x$. Find the first-order derivative of $f(x)$.
- a) -2
 - b) $10 - x$
 - c) $10 - 4x$
 - d) $-4x$
 - e) I don't know
24. Find the first-order derivative of the expression $x^{0.5}y^{0.5}$ with respect to x treating y as a constant.
- a) $x^{-0.5}$
 - b) $0.5x^{-0.5}$
 - c) $0.5x^{-0.5}y^{0.5}$
 - d) $0.5x^{-0.5}y^{-0.5}$
 - e) I don't know
25. Find the first-order derivative of the expression $5x^{0.5}y^{0.6}$ with respect to y treating x as a constant.
- a) $y^{-0.6}$
 - b) $3y^{-0.6}$
 - c) $3x^{0.5}y^{-0.6}$
 - d) $3x^{0.5}y^{-0.4}$
 - e) I don't know

Feedback

Please use the online version to get the feedback and for the list of correct answers.

Thank you.