

Self-diagnostic test

Name:

Student ID:

This test is to help you revise the background knowledge you need in the course. Try to attempt all questions. If you hand in the test with all questions done, we will receive 2% of the total course mark.

1. Factorize $3x^2 - 7x - 6$.

- A. $(3x + 2)(x + 3)$,
- B. $(3x - 2)(x - 3)$,
- C. $(3x + 2)(x - 3)$,
- D. $(3x - 2)(x + 3)$,
- E. It cannot be factorized.

2. Solve for x for the quadratic equation $x^2 + x - 1 = 0$.

- A. $\frac{1 \pm \sqrt{5}}{2}$,
- B. $\frac{-1 \pm \sqrt{5}}{2}$,
- C. $\frac{1 \pm \sqrt{3}}{2}$,
- D. $\frac{-1 \pm \sqrt{3}}{2}$,
- E. There is no real roots.

3. Factorize $1 + x + y + xy$.

- A. $(1 - x)(1 - y)$,
- B. $(1 + x)(1 + y)$,
- C. $(1 + xy)(1 + x)$,
- D. $(1 + x)xy$,
- E. It cannot be factorized.

4. Let $a, b, c > 0$. Simplify

$$\frac{a^{3/2}b^{-5/2}}{(ab)^{1/2}c^0}$$

- A. $\frac{a}{b}$,
- B. $\frac{a^2}{b}$,
- C. $\frac{a^2}{bc}$,
- D. $\frac{a}{b^3}$,
- E. $\frac{a}{b^3c}$.

5. Find the equation of straight line whose slope is $1/2$ and it passes through the point $(1/2, 1/2)$.

- A. $y = \frac{1}{2}x + \frac{1}{2}$,

- B. $y = -\frac{1}{2}x - \frac{1}{4}$,
- C. $y = -\frac{1}{2}x + \frac{1}{2}$,
- D. $y = \frac{1}{2}x - \frac{1}{4}$,
- E. $y = \frac{1}{2}x + \frac{1}{4}$.

6. Find the equation of the straight line which perpendicular to the straight line $3x + y - 4 = 0$ and it passes through the point $(1, -2)$.

- A. $y = 3x - \frac{7}{3}$,
- B. $y = -\frac{1}{3}x - \frac{5}{3}$,
- C. $y = \frac{1}{3}x - \frac{7}{3}$,
- D. $y = 3x - \frac{5}{3}$,
- E. $y = \frac{1}{3}x$.

7. Solve the following system of linear equations. $\begin{cases} 3x + y = -2, \\ x + 5y = 4. \end{cases}$

- A. $(x, y) = (-1, 1)$,
- B. $(x, y) = (1, 1)$,
- C. $(x, y) = (-1, -1)$,
- D. $(x, y) = (1, -1)$,
- E. $(x, y) = (-1, -\frac{1}{2})$.

8. Solve the following system of equations. $\begin{cases} y = x^2 + 4x + 4, \\ y = 6x + 7. \end{cases}$

- A. $(-1, -1)$ and $(-3, -25)$
- B. $(1, 1)$ and $(3, 25)$,
- C. $(-1, 1)$ and $(-3, 25)$,
- D. $(-1, 1)$ and $(3, 25)$,
- E. $(-1, -1)$ and $(3, 25)$

9. Sketch the graph $y = x^2 - 5x + 6$. Indicate the x -intercept and y -intercept and the vertex.