

Grade: 10

Stream: Advanced

Subject: Mathematics

Number of Pages: (7)

End of Term 1 Exam
Academic Year 2018/2019

Part I

45

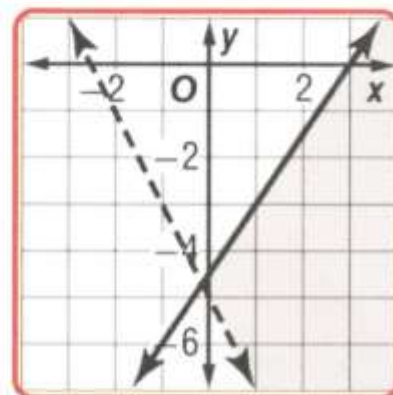
Circle the letter corresponding to the correct answer.

- 1) Solve the system of equations
- $$\begin{aligned}x - 2y &= -6 \\ 3x + 2y &= 22\end{aligned}$$

- a) (3, 2) b) (4, 5)
c) (5, 4) d) (1, -2)

- 2) Which system of inequalities is graphed?

- a) $2x + y \geq 5$
 $3x + 2y \leq 9$
b) $2x + y > -5$
 $3x - 2y \geq 9$
c) $2x - y \leq 5$
 $3x + 2y < 9$
d) $-2x + y > 5$
 $3x - 2y < 9$



- 3) What is the value of $\begin{vmatrix} 3 & 1 \\ -2 & 4 \end{vmatrix}$?

- a) 10 b) -14
c) -2 d) 14

4) What is the equation of the axis of symmetry of $y = (x - 2)^2 + 3$?

a) $x = 3$

b) $x = 2$

c) $y = 3$

d) $y = 2$

5) Find r_{21} in the matrix $R = \begin{bmatrix} -2 & 0 & 5 \\ 4 & 6 & -1 \end{bmatrix}$.

a) -1

b) 6

c) 4

d) 0

6) Solve the equation $2x^2 - 5x = -2$.

a) $x = \frac{1}{2}, 2$

b) $x = -2, \frac{-1}{2}$

c) $x = -2, -1$

d) $x = 1$

7) Which quadratic equation has the roots -1 and 4 ?

a) $x^2 + 3x - 4 = 0$

b) $x^2 - x + 4 = 0$

c) $x^2 - 3x - 4 = 0$

d) $x^2 - 4x - 3 = 0$

8) Simplify $(5 + 2i)(1 + 3i)$.

a) $5 + 6i$

b) -1

c) $11 + 17i$

d) $-1 + 17i$

9) Simplify $(7x^3 - 2x^2 + 3) + (x^2 - x - 5)$.

a) $7x^3 - 2x^2 - x - 2$

b) $7x^3 - 3x^2 - 2$

c) $8x^5 - 3x^2 - 2$

d) $7x^3 - x^2 - x - 2$

10) Simplify $(6x^3 - 16x^2 + 11x - 2) \div (3x - 2)$.

a) $2x^2 - 4x + 1$

b) $6x^2 - 12x + 3$

c) $2x^2 + 4x - 1$

d) $x^2 + 8x - 3$

11) One factor of $(x^3 + 2x^2 - 11x - 12)$ is $(x + 4)$. Find the remaining two factors.

a) $(x + 1), (x + 3)$

b) $(x - 1), (x + 3)$

c) $(x + 1), (x - 3)$

d) $(x - 1), (x - 3)$

12) Identify the x-intercept of the graph of $y = \sqrt{2x+1}$.

a) $\frac{1}{2}$

b) 0

c) $-\frac{1}{2}$

d) 1

13) Find the inverse of $f(x) = 3x + 8$.

a) $f^{-1}(x) = 8x - 3$

b) $f^{-1}(x) = \frac{1}{3}x - 8$

c) $f^{-1}(x) = \frac{1}{3}x - \frac{8}{3}$

d) $f^{-1}(x) = x + \frac{8}{3}$

14) Solve $x^4 + 2x^2 - 24 = 0$.

a) $x = \pm 2, \pm\sqrt{6}$

b) $x = \pm 2, \pm i\sqrt{6}$

c) $x = \pm 2i, \pm\sqrt{6}$

d) $x = -\sqrt{6}, 2, 2i, i\sqrt{6}$

15) If $x \neq 0$, what is the value of $\sqrt[5]{x^3} \div x^{\frac{3}{5}}$?

a) 1

b) $\frac{1}{3}x$

c) x

d) $\frac{1}{5}$

Part II

55

Show all the details when answering these questions.

Use matrices A and B to answer questions 16, 17, and 18.

$$A = \begin{bmatrix} 2 & 1 \\ 4 & 3 \end{bmatrix}, \quad B = \begin{bmatrix} 7 & -5 \\ 2 & -1 \end{bmatrix}$$

16) $-2B + 3A =$

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17) $AB =$

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18) $A^{-1} =$

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19) Determine whether the function $f(x) = -5x^2 + 4x - 8$ has a maximum or minimum value and find that value, then state the domain and range of $f(x)$.

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20) Solve the equation $x^2 - 4x = -13$ by using the quadratic formula.

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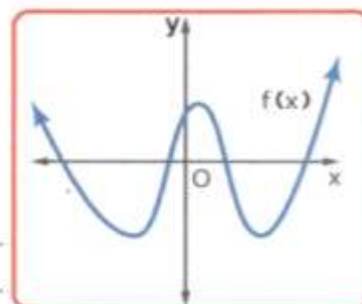
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Use the graph to answer questions 21, 22, and 23.



21) Describe the end behavior for the polynomial $f(x)$.

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22) Determine whether $f(x)$ represents an odd-degree or an even-degree function. Justify your answer.

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23) State the number of real zeros for the function. Justify your answer.

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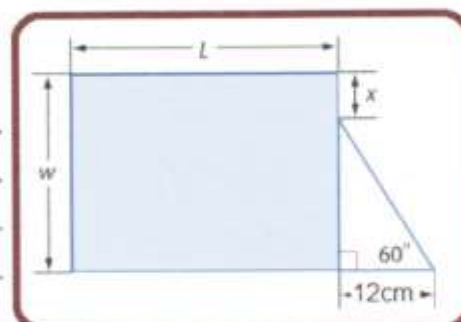
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24) The area of the rectangle at the right is 750 cm^2 , where $L > w$. **BONUS**

a) Write an equation connecting x and L .



b) Find the value of x if the perimeter of the rectangle is 110 cm .

25) Solve the inequality $\sqrt{2x+4} + 1 \leq 5$ algebraically.

End of Exam

Good Luck