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Grade	10
Subject	Mathematics
Stream	Advanced
Number of Pages	10

Part I	
Circle the letter corresponding to the correct answer.	45

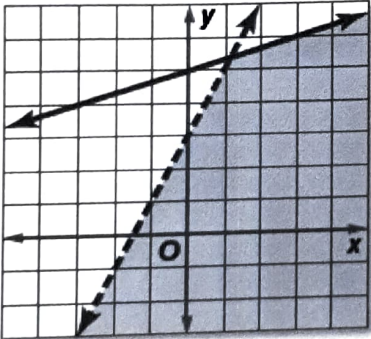
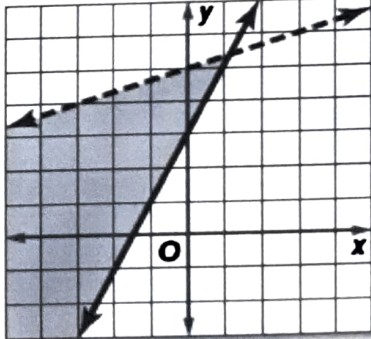
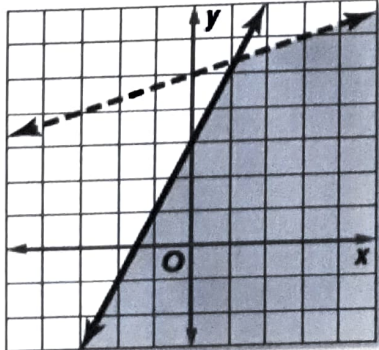
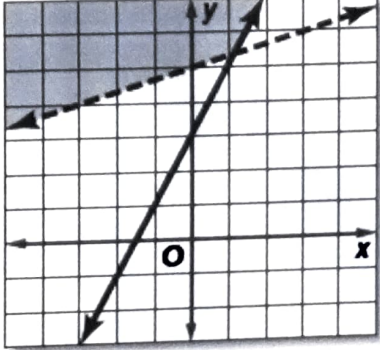
Describe the system of equations. $2x + 5y = 10$
 $20 + 10y = -4x$



1

A	consistent
B	inconsistent
C	independent
D	consistent and dependent

Which graph shows the solution of the system of inequalities?
 $y \leq 2x + 3$
 $y < \frac{1}{3}x + 5$

2	A		C	
	B		D	



If $A = \begin{bmatrix} -2 & 3 \\ 0 & -1 \\ 2 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 3 \\ 0 & -4 \\ 2 & -1 \end{bmatrix}$, find $3A - B$.

3

A

$$\begin{bmatrix} -7 & 6 \\ 0 & 1 \\ 4 & 11 \end{bmatrix}$$

C

$$\begin{bmatrix} -5 & 6 \\ -6 & 1 \\ 4 & 13 \end{bmatrix}$$

B

$$\begin{bmatrix} -7 & 6 \\ -6 & -7 \\ 4 & 13 \end{bmatrix}$$

D

$$\begin{bmatrix} -7 & 6 \\ 0 & 1 \\ 4 & 13 \end{bmatrix}$$

Find the inverse of the matrix $A = \begin{bmatrix} 3 & 0 \\ 5 & 1 \end{bmatrix}$.

4

A

$$A^{-1} = \begin{bmatrix} \frac{1}{3} & 0 \\ -5 & \frac{1}{3} \end{bmatrix}$$

C

$$A^{-1} = \begin{bmatrix} \frac{1}{3} & 0 \\ \frac{-5}{3} & 1 \end{bmatrix}$$

B

$$A^{-1} = \begin{bmatrix} \frac{-1}{3} & -5 \\ 0 & \frac{-3}{2} \end{bmatrix}$$

D

$$A^{-1} = \begin{bmatrix} \frac{-1}{2} & 0 \\ \frac{5}{2} & \frac{-3}{2} \end{bmatrix}$$

Which quadratic function has a minimum at $x = 3$?

5

A

$$f(x) = x^2 - 6x + 7$$

B

$$f(x) = x^2 + 6x + 7$$

C

$$f(x) = -2x^2 + 12x + 7$$

D

$$f(x) = 2x^2 - 6x + 7$$

Write a quadratic equation with roots -3 and 5 in standard form.

6

A $x^2 - 15x - 2 = 0$

B $x^2 - 2x - 15 = 0$

C $x^2 - 2x + 15 = 0$

D $x^2 - 15x + 2 = 0$

Simplify $\frac{2+i}{1-i}$.



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A $\frac{1}{2} - \frac{3}{2}i$

B $\frac{1}{2} - \frac{1}{2}i$

C $\frac{1}{2} + \frac{1}{2}i$

D $\frac{1}{2} + \frac{3}{2}i$

Solve the inequality $x^2 - 7x + 12 < 0$ algebraically.

8

A $(-\infty, 3)$

B $(4, \infty)$

C $(3, 4)$

D $[3, 4]$

State the leading coefficient of the polynomial $(6 - 2a)(4 + 3a)$.

9

A 6

B 3

C -2

D -6

If $g(x) = 4x^3 + 2x$, find the value of $g(y^3)$.



10

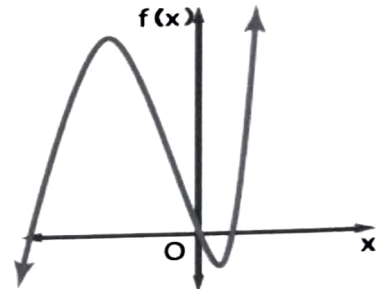
A $g(y^3) = 4y^6 + 2y^2$

B $g(y^3) = 4y^3 + 2y$

C $g(y^3) = 4y^9 + 2y^3$

D $g(y^3) = 16y^9 + 2y^3$

Use the degree and end behavior to find the polynomial in the shown graph.



11

A $f(x) = x^3 + 3x^2 - 4x$

B $f(x) = x^4 - 3x^2 + 4x$

C $f(x) = -2x^2 + 8x + 5$

D $f(x) = -4x^3 - 4x^2 + 8$

Factor completely the polynomial $x^3 - 4x$.

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- A $x(x^2 + 4)$
 B $x(x + 2)(x + 2)$
 C $x(x - 4)(x - 4)$
 D $x(x - 2)(x + 2)$

If $f(x) = x^2 - 4x$ and $g(x) = x + 2$, find $[g \circ f](x)$.

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- A $[g \circ f](x) = x^2 - 5x - 2$
 B $[g \circ f](x) = x^2 - 4x + 2$
 C $[g \circ f](x) = x^2 + 3x + 2$
 D $[g \circ f](x) = x^2 - 4$

Find the inverse of the function $f(x) = \frac{1}{3}x - 4$.

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- A $f^{-1}(x) = \frac{1}{3}x + 12$
 B $f^{-1}(x) = 3x + 12$
 C $f^{-1}(x) = \frac{1}{3}x - 12$
 D $f^{-1}(x) = 3x - 12$

Simplify $\frac{\sqrt[8]{81}}{\sqrt[6]{3}}$.



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- A $\sqrt[3]{3}$
 B $\sqrt[2]{27}$
 C $\sqrt[3]{81}$
 D $\sqrt[3]{9}$

Part II

Show all your work when answering these questions. 55

16 Mahmoud bought one liter of milk for AED 5 , two apples for AED 3 per apple, 4 loaves of bread for AED 1 per loaf, and 3 sweets for AED 2 per sweet.

a Organize this data into a matrix for items and a matrix for prices.

.....

b Use the multiplication of matrices to find the total amount Mahmoud spent on his shopping.

.....

Solve the system of equations using Cramer's Rule.

$$x + 6y = 4$$

$$2x - 3y = -7$$



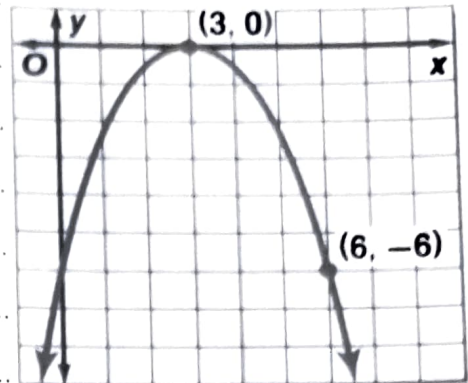
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Use a quadratic equation to find two consecutive even positive integers with a product of 120 .

18

Write an equation in vertex form for the parabola shown in the graph.



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Show that $x - 5$ is a factor of $x^3 - 7x^2 + 7x + 15$, then find the remaining factors of the polynomial.



20

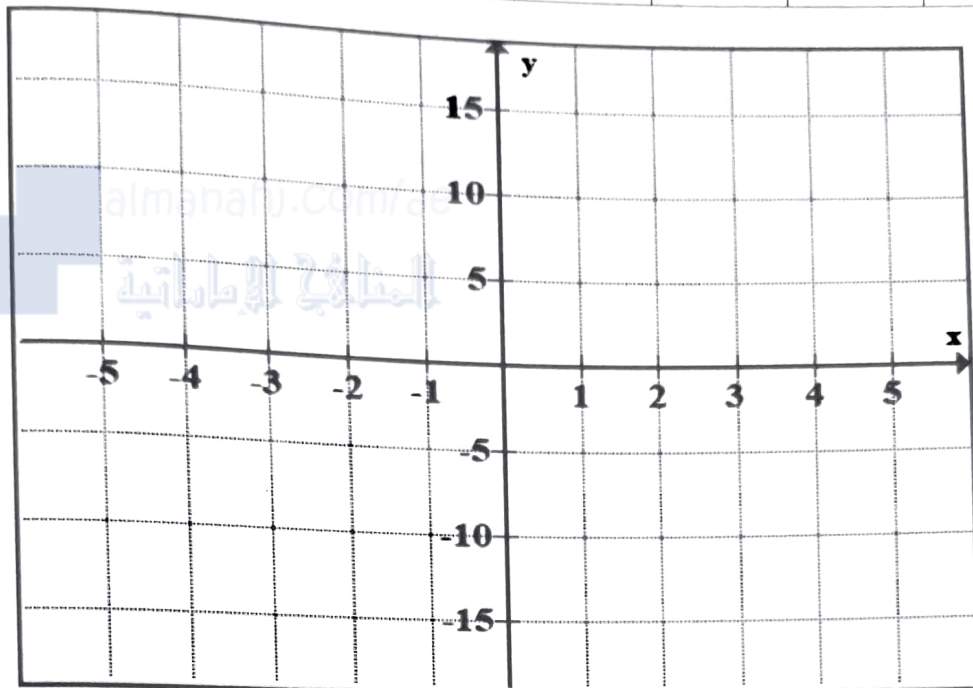
Given $f(x) = x^3 + x^2 - 6x - 3$, answer the following:



Graph the function by completing the table.

a

x	-3	-2	-1	0	1	2	3
$f(x)$							



21

b Determine the consecutive integer values of x between which each real zero of the function $f(x)$ is located.

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Solve the inequality $\sqrt{2x+2} + 1 \leq 5$ and summarize the solution with a number line.

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Simplify $3\sqrt[3]{36xy^2} \cdot 2\sqrt[3]{-6x^2y^4}$.

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End of Exam

Good Luck