



United Arab Emirates
Ministry of Education



الإمارات العربية المتحدة
وزارة التربية والتعليم



دائرة التعليم والمعرفة
DEPARTMENT OF EDUCATION

دائرة التعليم والمعرفة – مكتب العين التعليمي
مدرسة البدع للتعليم الأساسي والثانوي
الصف / الثاني عشر العام

Mock 2 - Math 12

Trimester 1

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Part I

45

Circle the letter corresponding to the correct answer.

1) Which of the following functions is even ?

a) $g(x) = x^3 - 2x$

b) $g(x) = -|x|$

c) $g(x) = x^4 - 2x$

d) $g(x) = x^4 - 3x^2 - 4$

2) If $f(x) = \begin{cases} x^2 - 3x & , \quad x \geq -2 \\ 2x + 1 & , \quad x < -2 \end{cases}$ find $f(-2)$

a) -3

b) -2

c) 10

d) -10

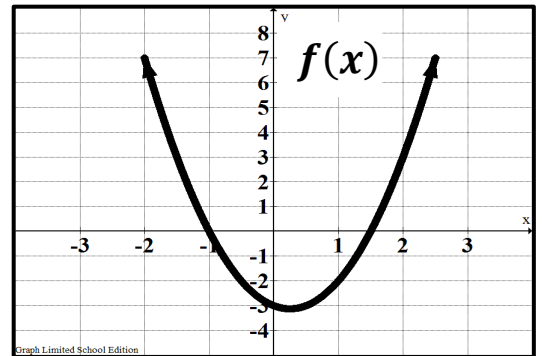
3) Use the graph of $f(x)$ to find the average rate of change of the function $f(x)$ over $[-1.2]$

a) -1

b) -3

c) $\frac{3}{2}$

d) 1



4) If $f(x) = x^2 - 3$, $g(x) = \sqrt{x + 3}$, $x \geq 0$ find $(f \circ g)(1)$

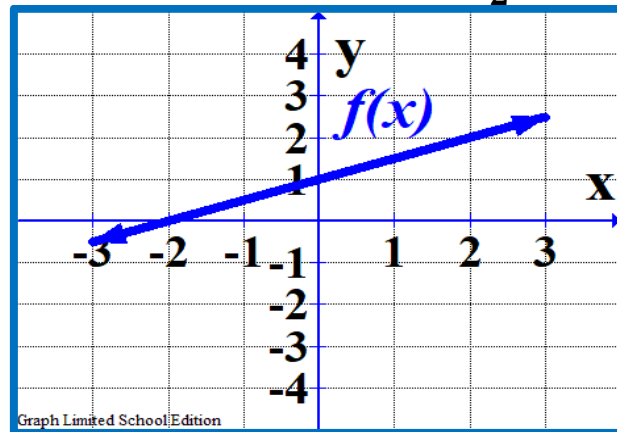
a) 1

b) -1

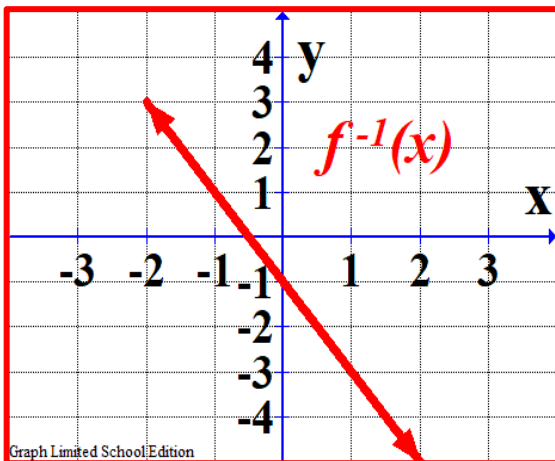
c) 2

d) -2

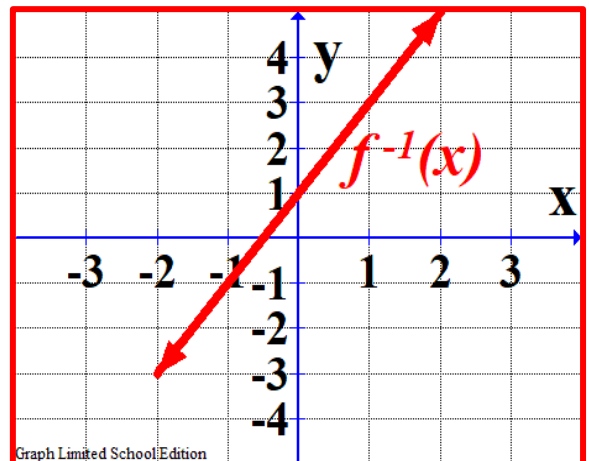
5) Which of the following represents the graph of inverse function $f^{-1}(x)$ by using the graph of $f(x) = \frac{1}{2}x + 1$



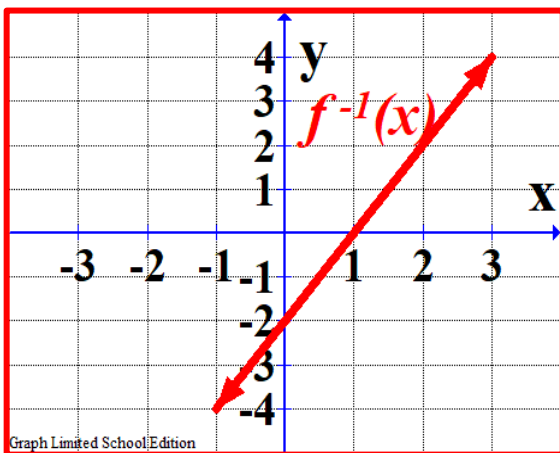
a)



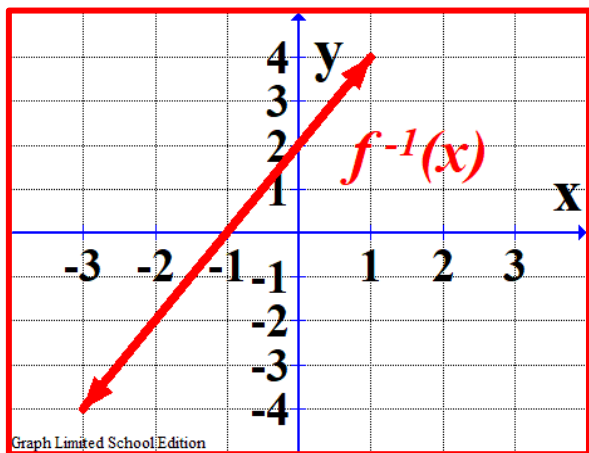
b)



c)



d)



6) What is the maximum number of real zeros for the function ?
 $f(x) = 3x^5 - 5x^4 + 2x^2 - 3x + 7$

a) 4

b) 3

c) 2

d) 5

7) Determine the binomial that is a factor of

$$f(x) = x^3 - 3x^2 - 4x + 12$$

a) $x - 3$

b) $x + 2$

c) $x - 4$

d) $x - 2$

8) Which is the solution for the inequality $x(x - 4) \geq 0$?

a) $(-\infty, 0] \cup [4, \infty)$

b) $[0, 4]$

c) $(-\infty, 0) \cup (4, \infty)$

d) $(0, 4)$

9) Solve $\log_6(x^2) = 2 \log_6(3) + 4 \log_6(2)$

a) 12

b) 6

c) ± 12

d) $\sqrt{14}$

10) $\ln(2e^2) =$

a) $2 + \ln 2$

b) 4

c) $2 - \ln 2$

d) $2e + 2\ln 2$

11) Which function is decay exponential ?

a) $f(x) = x^3 - 4x$

b) $f(x) = \frac{1}{3} (2)^x$

c) $f(x) = 6 \left(\frac{5}{4}\right)^x$

d) $f(x) = 4 \left(\frac{2}{3}\right)^x$

12) Determine the amplitude of $y = -5\cos(2\theta - \pi) + 4$

a) -5

b) 5

c) 4

d) $\frac{\pi}{2}$

13) Evaluate $\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right)$

a) $\frac{\pi}{4}, \frac{3\pi}{4}$

b) $\frac{3\pi}{4}$

c) $\frac{\pi}{4}$

d) $\frac{-\pi}{4}$

14) Find the exact values of $\frac{\tan 33 + \tan 12}{1 - \tan 33 \tan 12}$

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

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

c) 1

d) $\sqrt{2}$

15) Which of the following is not equivalent to $\cos \theta$
when $0 < \theta < \frac{\pi}{2}$

a) $\frac{\cos \theta}{\sin^2 \theta + \cos^2 \theta}$

b) $\tan \theta \csc \theta$

c) $\frac{1 - \sin^2 \theta}{\cos \theta}$

d) $\cot \theta \sin \theta$

Show all the details when answering these questions.

16) Use the shown graph represented $f(x)$ to answer the following questions :-

a) The range of $f(x)$

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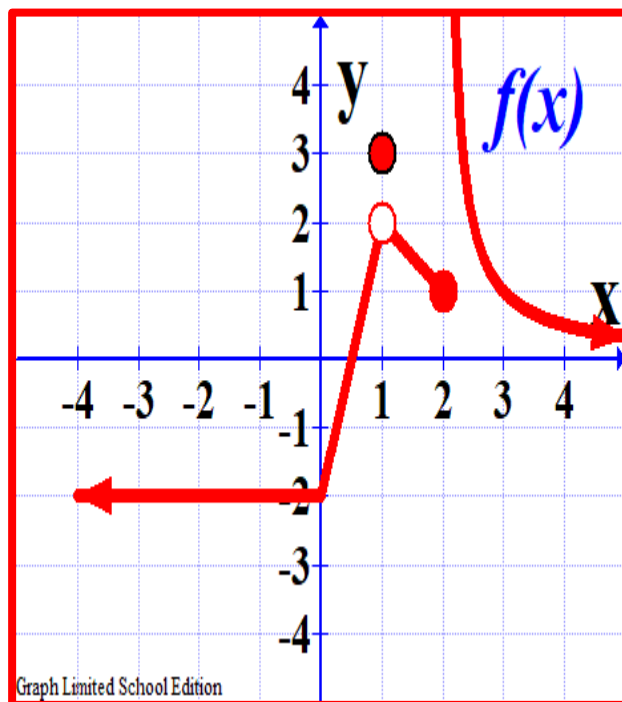
b) The zeros of $f(x)$

c) The relative maximum of $f(x)$

d) The type of discontinuous of the function $f(x)$ at $x = 1$

e) The intervals of $f(x)$ is

g) $\lim_{x \rightarrow -\infty} f(x) = \dots\dots\dots$ h) $\lim_{x \rightarrow \infty} f(x) = \dots\dots\dots$



17) Show algebraically $f(x) = \frac{1}{6}x - 2$, $g(x) = 6x + 12$ are inverse functions .

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18) If 20000 AED is invested in an online savings account 4.5% per year , how much will be in the account at the end of 5 years if there are no other deposits or withdrawals if the interest is compounded

a) Monthly

b) continuously

19) Write in standard form a polynomial of the least degree with real coefficients having among its zeros $\sqrt{2}$, $-\sqrt{2}$, $-3i$

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This image shows a full page of white paper with horizontal dashed lines, typical of primary-ruled notebook paper. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings present.

22) Solve $\ln(x) + \ln(x - 2) = 3\ln 2$

23) Verify that $\tan\left(\frac{\pi}{2} + \theta\right) = -\cot\theta$

24) The Area of a sector of a circle $6\pi \text{ cm}^2$ and the measure of central angle 135° Find the length of an arc in a circle

25) If $\cos\theta = \frac{-12}{13}$, $\frac{\pi}{2} < \theta < \pi$ find the exact value of $\sin 2\theta$, $\tan \frac{\theta}{2}$

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26) Use the shown graph represented $f(x)$ to answer the following questions :-

a) Determine the least possible degree of the polynomial $f(x)$

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b) Determine the end behavior of the function $f(x)$.

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c) Determine the zeros of $f(x)$.

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