بسم الله الرحمن الرحيم

تدريبات (٤) للامتحان النهائي

Question 1: (30 points)

Choose the correct answer, write your answer in the table below:

1. The degree of the polynomial $8x^4 + 3x^3 + 16x^6 - 4$ is:

a) 16 b) 6 c) 13 d) 8

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2. "Twice a number increased by five " is translated to:

a) $2x+5$ b) $2x^5$ c) $x+10$ d) $2x-5$

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3. The **x – intercept** for the line $3x+6y=12$ is:

a) $(12,0)$ b) $(4,0)$ c) $(0,2)$ d) $(3,6)$

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4. The simplification of $(2a^3b^2)^3$ is:

a) $8a^6b^5$ b) $6a^9b^6$ c) $8a^9b^6$ d) $2a^6b^5$

5. The equation of the line whose slope is **4** and containing the point $(-2,-3)$ is:

a) $y=-4x-5$ b) $y=-4x+5$ c) $y=4x-5$ d) $y=4x+5$

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6. The solution set for the equation $|x|=-5$ is :

a) $\{5\}$ b) $\{-5\}$ c) ϕ d) $\{5,-5\}$

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7. The first coordinate is always negative in quadrants:

a) I and II b) II and III c) I and IV d) III and IV

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8. The simplification of $27^{\frac{2}{3}}$ is:

a) 3 b) 12 c) 9 d) 27

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9. The set of numbers for which the rational expression $\frac{(x-1)(x-3)}{(x-2)(x-5)}$ is <u>not defined</u>is:

a) $\{2,5\}$ b) $\{-2,-5\}$ c) $\{1,3\}$ d) $\{-1,-3\}$

10. The result of $\sqrt{-200}$ is :

a) $10\sqrt{2}$ b) $-10\sqrt{2}$ c) $-10\sqrt{2}i$ d) $10\sqrt{2}i$

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11. The factorization of a^2-81 is:

a) $(a-9)(a+9)$ b) $a(a-81)$ c) $(a+81)(a-81)$ d) $(a-9)(a-9)$

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12. The Greatest Common Factor (GCF) of $12x^6$ and $20x^2$ is:

a) $240x^8$ b) $2x$ c) $4x^2$ d) $60x^6$

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13. The domain of the function $f(x)=\dfrac{|x-2|}{\sqrt{x+5}}$ is:

a) $\{x \mid x \text{ is a real number and } x>-5\}$

b) $\{x \mid x \text{ is a real number and } x\neq 2\}$

c) $\{x \mid x \text{ is a real number and } x\geq -5\}$

d) $\{x \mid x \text{ is a real number and } x\neq -5\}$

14. The interval notation for the set $\{x \mid -3 < x \leq 6\}$ is:

a) $(-3,6)$ b) $[-3,6)$ c) $[-3,6]$ d) $(-3,6]$

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15. The result of the division $\dfrac{8x^6 - 2x^3}{2x^2}$ is:

a) $4x^3 - x^2$ b) $4x^4 - 2x$ c) $4x^4 - x$ d) $8x^4 - 2x$

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16. The result of the multiplication $(2x+1)(3x+2)$ is:

a) $6x^2 + 5x + 2$ b) $6x^2 + 7x + 2$ c) $6x^2 + 5x + 3$ d) $5x^2 + 5x + 3$

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17. If $f(x) = \sqrt{5-2x}$, then $f(x) = \sqrt{-2}$ is equal to:

a) 1 b) -1 c) -3 d) 3

18. The set $\{....., -4, -3, -2, -1, 0, 1, 2, 3, 4, ...\}$ is called the set of :

a) Integers b) Whole numbers c) Natural numbers d) Rational numbers

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19. The simplification of $-\left| -\frac{2}{3} \right|$ is:

a) $\frac{2}{3}$ b) $-\frac{2}{3}$ c) $\frac{3}{2}$ d) $-\frac{3}{2}$

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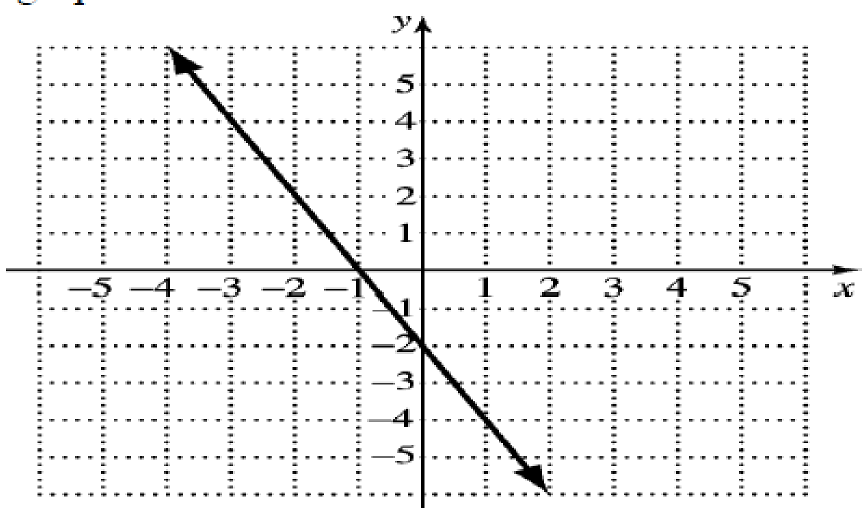
20. The equation illustrated by this graph is:



a) $x + 2y = -2$ b) $-x + 2y = 2$ c) $2x + y = -2$ d) $x - 2y = 2$

Question 2:

1)

$$\frac{1}{2x-1}+\frac{3}{(2x-1)(x+1)}+\frac{1}{x+1}=\frac{x+1+3+2x-1}{(2x-1)(x+1)}=\frac{3x+3}{(2x-1)(x+1)}$$

$$=\frac{3(x+1)}{(2x-1)(x+1)}=\frac{3}{2x-1}.$$

2) $\dfrac{2x-6}{(x+1)^2} \times \dfrac{x^2-1}{3-x}=$

$$\frac{2(x-3)}{(x+1)(x+1)}\times\frac{(x+1)(x-1)}{-(x-3)}=\frac{-2(x-1)}{x+1}=\frac{-2x+2}{x+1}$$

Question 3:

1) $|2x-3|=|3x+1|$

There are two cases to consider.

Either $2x-3=3x+1$ OR $2x-3=-3x-1$

For either case $x=-4$ & for OR case $x=\frac{2}{5}$ the solution set $=\left\{-4,\frac{2}{5}\right\}$.

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

$$\Delta = b^2 - 4ac = -8 \qquad x = \frac{-b \pm \sqrt{\Delta}}{2a} \qquad x = \frac{2 \pm \sqrt{-8}}{2} \qquad x = \frac{2 \pm 2\sqrt{2}i}{2}$$

$x = 1 \pm \sqrt{2}i$ The solution set $= \left\{1 + \sqrt{2}i, 1 - \sqrt{2}i\right\}$.

Question 4:

1) $\frac{3}{2}x-1\leq x+\frac{1}{3}$ ⇒ $\frac{3}{2}x-x\leq\frac{1}{3}+1$ ⇒ $\frac{x}{2}\leq\frac{4}{3}$ ⇒ $x\leq\frac{8}{3}$

The solution interval $=\left(-\infty,\frac{8}{3}\right]$.

2) $5\left|3x-1\right|-7\geq 8$

$5\left|3x-1\right|\geq 15$ ⇒ $\left|3x-1\right|\geq 3$ Either $3x-1\geq 3$ OR $3x-1\leq -3$

For either case $x\geq\frac{4}{3}$ and for OR case $x\leq -\frac{2}{3}$.

The solution set $=\left(-\infty,-\frac{2}{3}\right]\cup\left[\frac{4}{3},\infty\right)$.

Question 5:

$$\begin{cases} x - y - 2z = 1 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1) \\ x - 5y + 2z = 5 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(2) \\ 2x - 3y - 4z = 2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3) \end{cases}$$

Take the first equation with the second one and on other side take the first with the third and eliminate z .

$$\begin{cases} x - y - 2z = 1 \\ x - 5y + 2z = 5 \end{cases} \qquad \begin{cases} -2(x - y - 2z = 1) \\ 2x - 3y - 4z = 2 \end{cases}$$

$2x - 6y = 6 \ldots\ldots\ldots(4).$ $\qquad$ $y = 0$

Substitute the value of y in equation number 4 and then find x , we have:

$2x - 6(0) = 6$ Implies that $x = 3$ now find the value of z using any equation of the system.

$x - y - 2z = 1$

$3 - 0 - 2z = 1$

$z = 1$

The solution point $= (3, 0, 1)$.