MATH 095 Sample 02 Exam 2

For each problem, show your work in the space provided.
Write your Final Answer (and the letter answer) on the Answer Sheet provided.

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Factor:

1. $6xu - 15u - 10xy + 25y$

2. $15x^2 - 37xy + 20y^2$

   [A] $(5x + 4y)(3x + 5y)$ [B] $(5x + 4y)(3x - 5y)$

   [C] $(5x - 4y)(3x + 5y)$ [D] $(5x - 4y)(3x - 5y)$

3. Solve: $x^2 - x - 72 = 0$ [A] –8, 9 [B] 8, 9 [C] –9, –8 [D] –9, 8

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Factor:

4. $64x^2 - 25y^2$

   [A] $(8x-5y)^2$ [B] $(8x+5y)^2$ [C] $(8x+5y)(8x-5y)$ [D] $(8x+5)(8x-5)$

5. $64x^2 - 48xy + 9y^2$

   [A] $(64x-3y)(x+3y)$ [B] $(8x-3y)^2$ [C] $(8x-3y)(8x+3y)$ [D] $(8x+3y)^2$

6. $36x^2 + 60xy + 25y^2$

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7. Determine the value or values of the variable for which $\frac{x+4}{x^2+4x+3}$ is defined.

[A] all real numbers except $x = -1$ and $x = -3$ [B] all real numbers except $x = -4$

[C] all real numbers except $x = 3$ and $x = 4$ [D] all real numbers except $x = 0$

8. Multiply: $x-2 \cdot \frac{x+3}{x^2-4}$ [A] $\frac{3}{2}$ [B] $\frac{x+3}{x-2}$ [C] $\frac{x+3}{(x-2)(x^2-4)}$ [D] $\frac{x+3}{x+2}$

9. Find the LCM of r^2, r^2-4 and r^2-4r+4.

[A] $r^2(r-2)(r+2)$ [B] $r^2(r^2-4)(r-2)^2$

[C] $r^2(r+2)(r-2)^2$ [D] $r^2(r-2)(r+2)^2$

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10. Write 860×10^{-4} in standard form.

11. Simplify: $\dfrac{n + \dfrac{4}{m}}{n^2 - \dfrac{1}{m^2}}$

[A] $\dfrac{m^2n-1}{m^2n^2+4m}$ [B] $\dfrac{m^2n+4}{m^2n^2-m}$ [C] $\dfrac{m^2n+4m}{m^2n^2-1}$ [D] $\dfrac{m^2(n+4)}{m^2n^2-1}$

12. Solve: $\dfrac{x}{x-1} = 1 + \dfrac{1}{x-1}$ [A] $\{1\}$ [B] $\{x \mid x \neq 1\}$ [C] $\{x \mid x \neq 0\}$ [D] $\varnothing$

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13. If r is inversely proportional to the square of s and r is $\frac{5}{81}$ when s is 9, find r when s is 4.

[A] $\frac{80}{6561}$ [B] $\frac{20}{729}$ [C] $-\frac{400}{81}$ [D] $\frac{5}{16}$

14. If s varies jointly with t and the square of u, and s is 392 when t is 2 and u is 7, find s when t is 7 and u is 9.

[A] 411 [B] 2268 [C] 1764 [D] 7938

15. Rationalize the denominator: $\frac{\sqrt{11}}{\sqrt{3z}}$

[A] $\frac{\sqrt{33z}}{9z^2}$ [B] $\frac{\sqrt{33z}}{3z}$ [C] $\frac{\sqrt{11}}{3z}$ [D] $\sqrt{11}$

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16. Solve: $\sqrt{x + 5} = -3$

[A] no real number solutions [B] 4, –14 [C] –14 [D] 4

17. Simplify: $\sqrt[3]{125x} - 9\sqrt[3]{x^4} - 8\sqrt[3]{x} + 6x\sqrt[3]{x}$

18. Multiply: $x^{4/7}\left(x^{3/7} + x^{1/7}\right)$

[A] $x^{16/49}$ [B] $x^{12/7}$ [C] $x^{12/49} + x^{4/49}$ [D] $x + x^{5/7}$

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Solve:

19. $x^2 - 2x - 15 = 0$

20. $6x^2 + 25x + 25 = 0$

[A] $-\frac{5}{3}, \frac{5}{2}$ [B] $-\frac{5}{3}, -\frac{5}{2}$ [C] $\frac{5}{3}, \frac{5}{2}$ [D] $\frac{5}{3}, -\frac{5}{2}$

21. $\frac{x^2}{4} - \frac{5x}{4} = -\frac{3}{2}$

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22. Solve by completing the square: $4x^2 + 2x - 5 = 0$

23. Determine the nature of the roots: $3x^2 - 6x - 2 = 0$

24. Perform the indicated operations and give the answer in standard complex number form:
$-5i(5i - 1) + 5(1 - 2i)$

[A] $20 + 15i$ [B] $-30 + 15i$ [C] $30 - 5i$ [D] $-10 - 15i$

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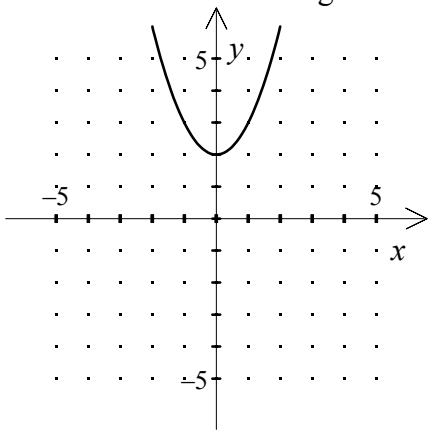
25. Find the domain and range for the function graphed below.



26. Determine the domain of the function $h(x) = \dfrac{4x}{x(x^2 - 25)}$.

[A] $\{x|x \neq \pm 5\}$ [B] $\{x|x \neq \pm 5, x \neq 0\}$ [C] $\{x|x \neq \pm 25, x \neq 0\}$ [D] $\{x|x \neq 5\}$

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27. Graph: $f(x) = -3x + 3$

28. If $f(x) = x^3$ and $g(x) = 1 - 2x^2$, find $g(f(x))$.

[A] $x^3 - 2x^5$ [B] $1 - 2x^6$ [C] $\frac{x^3}{1 - 2x^2}$ [D] $\left(1 - 2x^2\right)^3$

29. Let $f(x) = 16 - x^2$, $g(x) = 4 - x$. Find $\frac{f}{g}(x)$.

[A] $4 + x$ [B] $-x^2 - x + 20$ [C] $x^3 - 4x^2 - 16x + 64$ [D] $-x^2 + x + 12$

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30. Is $f(x) = 5x^2 + 2$ a one-to-one function?

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[1] _____

[2] _____

[3] _____

[4] _____

[5] _____

[6] _____

[7] _____

[8] _____

[9] _____

[10] _____

[11] _____

[12] _____

[13] _____

[14] _____

[15] _____

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[16] _____

[17] _____

[18] _____

[19] _____

[20] _____

[21] _____

[22] _____

[23] _____

[24] _____

[25] _____

[26] _____

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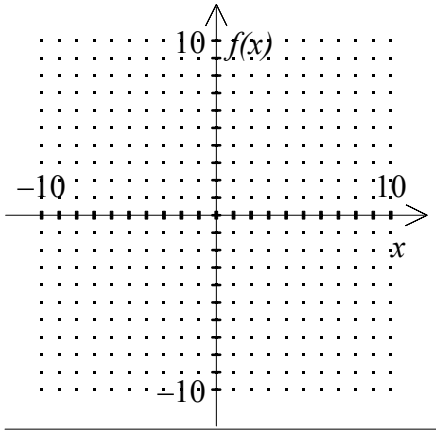

[27] _____

[28] _____

[29] _____

[30] _____

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[1] $(2x-5)(3u-5y)$

[2] [D]

[3] [A]

[4] [C]

[5] [B]

[6] $(6x+5y)^2$

[7] [A]

[8] [D]

[9] [C]

[10] 0.086

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[11] [C]

---

[12] [B]

---

[13] [D]

---

[14] [B]

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[15] [B]

---

[16] [A]

---

[17] $-3\sqrt[3]{x} - 3x\sqrt[3]{x}$

---

[18] [D]

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[19] –3, 5

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[20] [B]

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[21] 3, 2

[22] $\dfrac{-1 \pm \sqrt{21}}{4}$

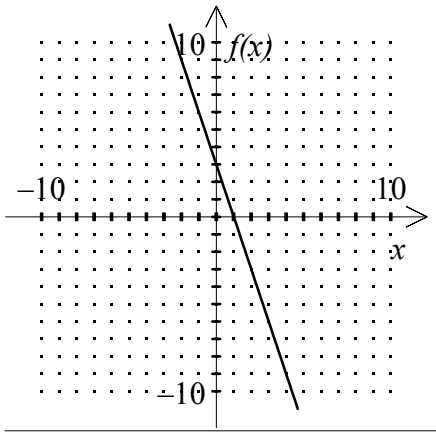
[23] two unequal real roots

[24] [C]

[25] Domain: All Real Numbers x
Range: $y \geq 2$

[26] [B]

[27]



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[28] [B]

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[29] [A]

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[30] no