



CHANNEL VIEW

An Expeditionary Learning School



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Calculus (402)

Dear Parents:

In our effort to academically prepare your child for the coming school year, the math teachers at Channel View School for Research have prepared a math packet for the summer vacation to help your child reinforce and maintain his/her math skills.

Students are expected to complete all assigned work in the packet. Parents are asked to certify that their child completed the assignment. The math packet will be collected, scored, and reviewed in class. The completed math packet is due to your child's math teacher on the first day of school, **Thursday, September 5, 2019.**

Working together we can insure maximum success for your child. Your cooperation in this matter is appreciated.

We wish you a happy and healthy summer.

Sincerely,

Mrs. Harper-Richardson
Principal

I certify that my child has completed the required 2019 Summer Vacation Math Assignment.

Student's Name _____ Entering Grade _____

Parent's Signature _____ Date _____

Name _____

<p>1. The solution set for the equation $\sqrt{56 - x} = x$ is</p> <p>(1) $\{-8, 7\}$ (3) $\{7\}$ (2) $\{-7, 8\}$ (4) $\{ \}$</p>	<p>5. When $b > 0$ and d is a positive integer, the expression $(3b)^{\frac{2}{d}}$ is equivalent to</p> <p>(1) $\frac{1}{(\sqrt[d]{3b})^2}$ (3) $\frac{1}{\sqrt{3b^d}}$ (2) $(\sqrt{3b})^d$ (4) $(\sqrt[b]{3d})^2$</p>
<p>2. The zeros for $f(x) = x^4 - 4x^3 - 9x^2 + 36x$ are</p> <p>(1) $\{0, \pm 3, 4\}$ (3) $\{0, \pm 3, -4\}$ (2) $\{0, 3, 4\}$ (4) $\{0, 3, -4\}$</p>	<p>6. Julie averaged 85 on the first three tests of the semester in her mathematics class. If she scores 93 on each of the remaining tests, her average will be 90. Which equation could be used to determine how many tests, T, are left in the semester?</p> <p>(1) $\frac{255 + 93T}{3T} = 90$ (3) $\frac{255 + 93T}{T + 3} = 90$ (2) $\frac{255 + 90T}{3T} = 93$ (4) $\frac{255 + 90T}{T + 3} = 93$</p>
<p>3. Given i is the imaginary unit, $(2 - yi)^2$ in simplest form is</p> <p>(1) $y^2 - 4yi + 4$ (3) $-y^2 + 4$ (2) $-y^2 - 4yi + 4$ (4) $y^2 + 4$</p>	<p>7. If $g(c) = 1 - c^2$ and $m(c) = c + 1$, then which statement is <i>not</i> true?</p> <p>(1) $g(c)m(c) = 1 + c - c^2 - c^3$ (2) $g(c) + m(c) = 2 + c - c^2$ (3) $m(c) - g(c) = c + c^2$ (4) $m(c)g(c) = -11 - c$</p>
<p>4. A solution of the equation $2x^2 + 3x + 2 = 0$ is</p> <p>(1) $-\frac{3}{4} + \frac{1}{4}i\sqrt{7}$ (3) $-\frac{3}{4} + \frac{1}{4}\sqrt{7}$ (2) $-\frac{3}{4} + \frac{7}{4}i$ (4) $\frac{1}{2}$</p>	<p>8. Which function represents exponential decay?</p> <p>(1) $y = 2^{0.3t}$ (3) $y = (\frac{1}{2})^{-t}$ (2) $y = 1.2^{3t}$ (4) $y = 5^{-t}$</p>

<p>9. The solution of $87e^{0.3x} = 5918$, to the <i>nearest thousandth</i>, is</p> <p>(1) 0.583 (3) 4.220 (2) 1.945 (4) 14.066</p>	<p>13. The expression $\frac{4x^3 + 5x + 10}{2x + 3}$ is equivalent to</p> <p>(1) $2x^2 + 3x - 7 + \frac{31}{2x + 3}$ (3) $2x^2 + 2.5x + 5 + \frac{15}{2x + 3}$ (2) $2x^2 - 3x + 7 - \frac{11}{2x + 3}$ (4) $2x^2 - 2.5x - 5 - \frac{20}{2x + 3}$</p>
<p>10. Which value, to the <i>nearest tenth</i>, is <i>not</i> a solution of $p(x) = q(x)$ if $p(x) = x^3 + 3x^2 - 3x - 1$ and $q(x) = 3x + 8$?</p> <p>(1) -3.9 (3) 2.1 (2) -1.1 (4) 4.7</p>	<p>14. If $f(x) = x^2 + 9$ and $g(x) = x + 3$, which operation would <i>not</i> result in a polynomial expression?</p> <p>(1) $f(x) + g(x)$ (3) $f(x) \cdot g(x)$ (2) $f(x) - g(x)$ (4) $f(x) \div g(x)$</p>
<p>11. Given $f^{-1}(x) = -\frac{3}{4}x + 2$, which equation represents $f(x)$?</p> <p>(1) $f(x) = \frac{4}{3}x - \frac{8}{3}$ (3) $f(x) = \frac{3}{4}x - 2$ (2) $f(x) = -\frac{4}{3}x + \frac{8}{3}$ (4) $f(x) = -\frac{3}{4}x + 2$</p>	<p>15. The equation $4x^2 - 24x + 4y^2 + 72y = 76$ is equivalent to</p> <p>(1) $4(x - 3)^2 + 4(y + 9)^2 = 76$ (2) $4(x - 3)^2 + 4(y + 9)^2 = 121$ (3) $4(x - 3)^2 + 4(y + 9)^2 = 166$ (4) $4(x - 3)^2 + 4(y + 9)^2 = 436$</p>
<p>12. Given $f(x) = \frac{1}{2}x + 8$, which equation represents the inverse, $g(x)$?</p> <p>(1) $g(x) = 2x - 8$ (3) $g(x) = -\frac{1}{2}x + 8$ (2) $g(x) = 2x - 16$ (4) $g(x) = -\frac{1}{2}x - 16$</p>	<p>16. Which equation has $1 - i$ as a solution?</p> <p>(1) $x^2 + 2x - 2 = 0$ (3) $x^2 - 2x - 2 = 0$ (2) $x^2 + 2x + 2 = 0$ (4) $x^2 - 2x + 2 = 0$</p>

<p>17. To the <i>nearest tenth</i>, the value of x that satisfies</p> $2^x = -2x + 11$ <p>(1) 2.5 (3) 5.8 (2) 2.6 (4) 5.9</p>	<p>22. Which equation represents an odd function?</p> <p>(1) $y = \sin x$ (3) $y = (x + 1)^3$ (2) $y = \cos x$ (4) $y = e^{5x}$</p>
<p>18. Which factorization is <i>incorrect</i>?</p> <p>(1) $4k^2 - 49 = (2k + 7)(2k - 7)$ (2) $a^3 - 8b^3 = (a - 2b)(a^2 + 2ab + 4b^2)$ (3) $m^3 + 3m^2 - 4m + 12 = (m - 2)^2(m + 3)$ (4) $t^3 + 5t^2 + 6t + t^2 + 5t + 6 = (t + 1)(t + 2)(t + 3)$</p>	<p>23. The expression $\frac{x^3 + 2x^2 + x + 6}{x + 2}$ is equivalent to</p> <p>(1) $x^2 + 3$ (3) $2x^2 + x + 6$ (2) $x^2 + 1 + \frac{4}{x + 2}$ (4) $2x^2 + 1 + \frac{4}{x + 2}$</p>
<p>19. The value(s) of x that satisfy</p> $\sqrt{x^2 - 4x - 5} = 2x - 10$ <p>are</p> <p>(1) {5} (3) {5, 7} (2) {7} (4) {3, 5, 7}</p>	<p>24. The completely factored form of</p> $2d^4 + 6d^3 - 18d^2 - 54d$ <p>is</p> <p>(1) $2d(d^2 - 9)(d + 3)$ (3) $2d(d + 3)^2(d - 3)$ (2) $2d(d^2 + 9)(d + 3)$ (4) $2d(d - 3)^2(d + 3)$</p>
<p>20. The roots of the equation $3x^2 + 2x = -7$ are</p> <p>(1) $-2, -\frac{1}{3}$ (3) $-\frac{1}{3} \pm \frac{2i\sqrt{5}}{3}$ (2) $-\frac{7}{3}, 1$ (4) $-\frac{1}{3} \pm \frac{\sqrt{11}}{3}$</p>	<p>25. A researcher randomly divides 50 bean plants into two groups. He puts one group by a window to receive natural light and the second group under artificial light. He records the growth of the plants weekly. Which data collection method is described in this situation?</p> <p>(1) observational study (3) survey (2) controlled experiment (4) systematic sample</p>
<p>21. Which value is <i>not</i> contained in the solution of the system shown below?</p> $a + 5b - c = -20$ $4a - 5b + 4c = 19$ $-a - 5b - 5c = 2$ <p>(1) -2 (3) 3 (2) 2 (4) -3</p>	<p>26. A rabbit population doubles every 4 weeks. There are currently five rabbits in a restricted area. If t represents the time, in weeks, and $P(t)$ is the population of rabbits with respect to time, about how many rabbits will there be in 98 days?</p> <p>(1) 56 (3) 3688 (2) 152 (4) 81,920</p>

<p>27. When factored completely, $m^5 + m^3 - 6m$ is equivalent to</p> <p>(1) $(m + 3)(m - 2)$ (3) $m(m^4 + m^2 - 6)$ (2) $(m^3 + 3m)(m^2 - 2)$ (4) $m(m^2 + 3)(m^2 - 2)$</p>	<p>32. The solutions to $x + 3 - \frac{4}{x-1} = 5$ are</p> <p>(1) $\frac{3}{2} \pm \frac{\sqrt{17}}{2}$ (3) $\frac{3}{2} \pm \frac{\sqrt{33}}{2}$ (2) $\frac{3}{2} \pm \frac{\sqrt{17}}{2}i$ (4) $\frac{3}{2} \pm \frac{\sqrt{33}}{2}i$</p>
<p>28. Which statement about statistical analysis is <i>false</i>?</p> <p>(1) Experiments can suggest patterns and relationships in data. (2) Experiments can determine cause and effect relationships. (3) Observational studies can determine cause and effect relationships. (4) Observational studies can suggest patterns and relationships in data.</p>	<p>33.</p> <p>The expression $\left(\frac{m^2}{m^{\frac{1}{3}}}\right)^{-\frac{1}{2}}$ is equivalent to</p> <p>(1) $-\sqrt[6]{m^5}$ (3) $-m^5\sqrt{m}$ (2) $\frac{1}{\sqrt[6]{m^5}}$ (4) $\frac{1}{m^5\sqrt{m}}$</p>
<p>29. The solution to the equation $18x^2 - 24x + 87 = 0$ is</p> <p>(1) $-\frac{2}{3} \pm 6i\sqrt{158}$ (3) $\frac{2}{3} \pm 6i\sqrt{158}$ (2) $-\frac{2}{3} \pm \frac{1}{6}i\sqrt{158}$ (4) $\frac{2}{3} \pm \frac{1}{6}i\sqrt{158}$</p>	<p>34. The expression $6xi^3(-4xi + 5)$ is equivalent to</p> <p>(1) $2x - 5i$ (3) $-24x^2 + 30x - i$ (2) $-24x^2 - 30xi$ (4) $26x - 24x^2i - 5i$</p>
<p>30. For $x > 0$, which expression is equivalent to $\frac{\sqrt[3]{x^2} \cdot \sqrt{x^5}}{\sqrt[6]{x}}$?</p> <p>(1) x (3) x^3 (2) $x^{\frac{3}{2}}$ (4) x^{10}</p>	<p>35. When $g(x)$ is divided by $x + 4$, the remainder is 0. Given $g(x) = x^3 + 3x^2 - 6x + 8$, which conclusion about $g(x)$ is true?</p> <p>(1) $g(4) = 0$ (2) $g(-4) = 0$ (3) $x - 4$ is a factor of $g(x)$. (4) No conclusion can be made regarding $g(x)$</p>
<p>31. Which binomial is a factor of $x^4 - 4x^2 - 4x + 8$?</p> <p>(1) $x - 2$ (3) $x - 4$ (2) $x + 2$ (4) $x + 4$</p>	<p>36. What is the solution, if any, of the equation $\frac{2}{x+3} - \frac{3}{4-x} = \frac{2x-2}{x^2-x-12}$?</p> <p>(1) -1 (3) all real numbers (2) -5 (4) no real solution</p>

<p>37. The solution to the equation $4x^2 + 98 = 0$ is</p> <p>(1) ± 7 (3) $\pm \frac{7\sqrt{2}}{2}$ (2) $\pm 7i$ (4) $\pm \frac{7i\sqrt{2}}{2}$</p>	<p>42. Which binomial is <i>not</i> a factor of the expression</p> $x^3 - 11x^2 + 16x + 84?$ <p>(1) $x + 2$ (3) $x - 6$ (2) $x + 4$ (4) $x - 7$</p>
<p>38. Given $\cos \theta = \frac{7}{25}$, where θ is an angle in standard position terminating in quadrant IV, and $\sin^2 \theta + \cos^2 \theta = 1$, what is the value of $\tan \theta$?</p> <p>(1) $-\frac{24}{25}$ (3) $\frac{24}{25}$ (2) $-\frac{24}{7}$ (4) $\frac{24}{7}$</p>	<p>43. Consider the system shown below.</p> $2x - y = 4$ $(x + 3)^2 + y^2 = 8$ <p>The two solutions of the system can be described as</p> <p>(1) both imaginary (3) both rational (2) both irrational (4) one rational and one irrational</p>
<p>39. Which expression is equivalent to $(3k - 2i)^2$, where i is the imaginary unit?</p> <p>(1) $9k^2 - 4$ (3) $9k^2 - 12ki - 4$ (2) $9k^2 + 4$ (4) $9k^2 - 12ki + 4$</p>	<p>44. The function $f(x) = \frac{x-3}{x^2 + 2x - 8}$ is undefined when x equals</p> <p>(1) 2 or -4 (3) 3, only (2) 4 or -2 (4) 2, only</p>
<p>40. The roots of the equation $x^2 + 2x + 5 = 0$ are</p> <p>(1) -3 and 1 (3) $-1 + 2i$ and $-1 - 2i$ (2) -1, only (4) $-1 + 4i$ and $-1 - 4i$</p>	<p>45. The solution set for the equation</p> $\sqrt{x + 14} - \sqrt{2x + 5} = 1$ <p>(1) $\{-6\}$ (3) $\{18\}$ (2) $\{2\}$ (4) $\{2, 22\}$</p>
<p>41. The expression $\frac{-3x^2 - 5x + 2}{x^3 + 2x^2}$ can be rewritten as</p> <p>(1) $\frac{-3x-3}{x^2+2x}$ (3) $-3x^{-1} + 1$ (2) $\frac{-3x-1}{x^2}$ (4) $-3x^{-1} + x^{-2}$</p>	<p>46. What is the inverse of $f(x) = -6(x-2)$?</p> <p>(1) $f^{-1}(x) = -2 - \frac{x}{6}$ (2) $f^{-1}(x) = 2 - \frac{x}{6}$ (3) $f^{-1}(x) = \frac{1}{-6(x-2)}$ (4) $f^{-1}(x) = 6(x+2)$</p>

<p>47. For the system shown below, what is the value of z?</p> $y = -2x + 14$ $3x - 4z = 2$ $3x - y = 16$ <p>(1) 5 (3) 6 (2) 2 (4) 4</p>	<p>49. The expression $(x + a)(x + b)$ cannot be written as</p> <p>(1) $a(x + b) + x(x + b)$ (3) $x^2 + (a + b)x + ab$ (2) $x^2 + abx + ab$ (4) $x(x + a) + b(x + a)$</p>
<p>48. What is the quotient when $10x^3 - 3x^2 - 7x + 3$ is divided by $2x - 1$?</p> <p>(1) $5x^2 + x + 3$ (3) $5x^2 - x - 3$ (2) $5x^2 - x + 3$ (4) $5x^2 + x - 3$</p>	<p>50. If $n = \sqrt{a^5}$ and $m = a$, where $a > 0$, an expression for $\frac{n}{m}$ could be</p> <p>(1) $a^{\frac{5}{2}}$ (3) $\sqrt[3]{a^2}$ (2) a^4 (4) $\sqrt{a^3}$</p>