

Algebra 2 Honors ISLO Exam Review - Part 2 - MULTIPLE CHOICE

1. Solve $y = mx + b$ for m .

- a) $\frac{y-b}{x}$ b) $y - x - b$ c) $y - b - x$ d) $\frac{y}{x+b}$ e) NOT
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2. Solve $s = 2\pi rh + \pi r^2$ for h .

- a) $\frac{s}{2\pi r^2}$ b) $\frac{s - \pi r^2}{2\pi r}$ c) $\frac{s - 2\pi r}{\pi r^2}$ d) $\frac{s - 2}{r}$ e) NOT
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3. Given the relation $y = f(x)$, the relation that translates the graph downward three units is:

- a) $y = f(x+3)$ b) $y = f(x-3)$ c) $y = f(x)+3$ d) $y = f(x)-3$ e) NOT
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4. Solve: $|2n - 3| < 5$

- a) $(-1, 4)$ b) $(-4, 1)$ c) $n < -1$ and $n > 4$ d) $n < -1$ or $n > 4$ e) NOT
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5. Solve: $|2n + 3| \geq 7$

- a) $[-2, 5]$ b) $(-\infty, -2] \cup [5, \infty)$ c) $[-5, 2]$ d) $(-\infty, -5] \cup [2, \infty)$ e) NOT
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6. If you rent a van for one day and drive it 100 miles, the cost is \$72. If you drive it 150 miles, the cost is \$96. If the function is linear, how much will it cost to rent the van for one day and drive it 200 miles?

- a) \$120 b) \$96 c) \$168 d) \$144 e) NOT
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7. The slope of $3x - 7y = 4$ is

- a) $\frac{7}{3}$ b) $\frac{3}{7}$ c) $-\frac{3}{7}$ d) $-\frac{4}{7}$ e) NOT
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8. The y-intercept of $3x + 7y = 4$ is

- a) 4 b) $\frac{3}{7}$ c) $\frac{4}{7}$ d) $-\frac{4}{7}$ e) NOT
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9. The line perpendicular to $5x - 3y = 15$ has a slope of

- a) $\frac{5}{3}$ b) $\frac{3}{5}$ c) $-\frac{5}{3}$ d) $-\frac{3}{5}$ e) NOT
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10. The line parallel to $3x + 5y = 20$ has a slope of

- a) $\frac{5}{3}$ b) $\frac{3}{5}$ c) $-\frac{5}{3}$ d) $-\frac{3}{5}$ e) NOT
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11. The equation of the line parallel to $2x - 5y = -3$ containing the point $(5, -7)$ is

- a) $y = \frac{2}{5}x - 9$ b) $y = \frac{5}{2}x - 7$ c) $y = -\frac{2}{5}x + 7$ d) $y = -\frac{5}{2}x + 9$ e) NOT
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12. The sum of $4x^3 - 3x^2 + x - 8$ and $x^3 + 3x^2 - 3x + 9$ is

- a) $5x^3 - 2x + 1$ b) $4x^3 - 3x + 1$ c) $4x^3 + 6x^2 - 2x + 17$ d) $4x^6 - 9x^4 - 3x^2 - 72$
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13. Simplify $(m + 9)(m - 9)$

- a) $m^2 - 81$ b) $m^2 + 81$ c) $m^2 - 18m - 81$ d) $m^2 + 18m - 81$ e) NOT
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14. Which of the following is the square of a binomial?

- a) $x^2 + 20x + 36$ b) $x^2 - 13x + 36$ c) $x^2 - 12x + 36$ d) $x^2 - 12z - 36$ e) NOT
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15. The factorization of $xy^2 - xy - 2y + 2$ is

- a) $(y^2 - 1)(2x + 2)$ b) $(xy - 2)(y - 1)$ c) $(y + 1)(xy - 2)$ d) $(y - 1)(xy + 2)$ e) NOT
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16. The factorization of $15x^2 + x - 6$ is

- a) $(5x-3)(3x+2)$ b) $(5x+3)(3x-2)$ c) $(5x-6)(3x+1)$ d) $(5x+6)((3x-1)$ e) NOT
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17. The factorization of $a^3 - 8$ is

- a) $(a - 4)(a^2 + 4a + 2)$ b) $(a - 2)(a^2 + 2a + 4)$ c) $(a + 2)(a^2 + 2a - 4)$
 d) $(a + 2)(a^2 + 2a + 4)$ e) NOT
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18. If $C = \begin{bmatrix} 3 & -5 \\ 7 & 9 \end{bmatrix}$ and $D = \begin{bmatrix} -4 & 8 \\ 1 & 4 \end{bmatrix}$, then $C - D$

- a) $\begin{bmatrix} -1 & 3 \\ 8 & 13 \end{bmatrix}$ b) $\begin{bmatrix} -7 & 13 \\ -6 & -5 \end{bmatrix}$ c) $\begin{bmatrix} 7 & -13 \\ 6 & 5 \end{bmatrix}$ d) $\begin{bmatrix} 3 & -5 \\ -7 & 9 \end{bmatrix}$ e) NOT
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19. If $A = \begin{bmatrix} 3 & -5 & 4 \\ 2 & 0 & 7 \end{bmatrix}$ and $B = \begin{bmatrix} 6 & 0 \\ -3 & 1 \\ -2 & 4 \end{bmatrix}$ then $AB =$

- a) $\begin{bmatrix} 25 & 11 \\ -2 & 28 \end{bmatrix}$ b) $\begin{bmatrix} 18 & 15 & -8 \\ 0 & 0 & 28 \end{bmatrix}$ c) $\begin{bmatrix} 18 & 0 \\ 15 & 0 \\ -8 & 28 \end{bmatrix}$ d) $\begin{bmatrix} 18 & 15 & -8 \\ 12 & 0 & -14 \\ 0 & 0 & 28 \end{bmatrix}$ e) NOT
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20. If $A = \begin{bmatrix} 2 & 5 \\ 1 & 7 \end{bmatrix}$ then A^{-1} is

- a) $\begin{bmatrix} -2 & -5 \\ -1 & -7 \end{bmatrix}$ b) $\begin{bmatrix} \frac{1}{2} & \frac{1}{5} \\ 1 & \frac{1}{7} \end{bmatrix}$ c) $\begin{bmatrix} \frac{7}{9} & -\frac{5}{9} \\ -\frac{1}{9} & \frac{2}{9} \end{bmatrix}$ d) $\begin{bmatrix} -\frac{7}{9} & \frac{5}{9} \\ \frac{1}{9} & -\frac{2}{9} \end{bmatrix}$ e) NOT
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21. If $b \neq 0$, which of the exponents or powers property is *not* written correctly?

- a) $b^0 = 1$ b) $\frac{1}{(9b^n)} = \frac{b^{-n}}{9}$ c) $b^m \cdot b^n = b^{mn}$ d) $\frac{a^n}{b^n} = \left(\frac{a}{b}\right)^n$ e) NOT
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22. What is the equation of the line perpendicular to $y = 2x + 3$?

- a) $x + 2y = 6$ b) $x - 2y = -6$ c) $2y = -\frac{1}{2}x + 2$ d) $y = 2x - \frac{1}{3}$ e) NOT
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23. Suppose $f(x) = x^3 + 2x - 4$. What is $f(-2)$?

- a) -16 b) 0 c) 8 d) 16 e) NOT
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24. What is the domain of the function $f(x) = \frac{x-2}{x+4}$?

- a) $(-\infty, \infty)$ b) $(-\infty, 2) \cup (2, \infty)$ c) $(-\infty, -4) \cup (-4, \infty)$ d) $(-\infty, -4) \cup (-4, 2) \cup (2, \infty)$
 e) NOT
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25. What is the x-coordinate of the point of intersection of $-x + y = 2$ and $x + y = 6$?

- a) 1 b) 2 c) 3 d) 4 e) NOT
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26. What is the solution to the system? $y = \frac{1}{3}x$ and $x + 3y = 24$

- a) $(-4, -12)$ b) $(-12, -4)$ c) $(4, 12)$ d) $(12, 4)$ e) NOT
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27. Simplify $(8m + 2) + (5m + 7) + m$

- a) $13m + 5$ b) $14m + 9$ c) $13m + 9$ d) $14m + 5$ e) NOT
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28. What is the value of x in the matrix addition problem?

$$\begin{bmatrix} 3 \\ 6 \\ -1 \end{bmatrix} + \begin{bmatrix} -2 \\ 4 \\ -1 \end{bmatrix} = \begin{bmatrix} 1 \\ 10 \\ x \end{bmatrix} \quad \text{a) } 0 \quad \text{b) } -1 \quad \text{c) } 1 \quad \text{d) } 2 \quad \text{e) } \text{NOT}$$

29. Find the equation of the line that is parallel to the line $y = 5x + 2$ and passes through the point $(1, -3)$.

- a) $y = -5x + 2$ b) $y = 5x + 8$ c) $y = \frac{1}{5}x - 8$ d) $y = 5x - 8$ e) NOT
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30. Which function is modeled by the table?

x	f(x)
-2	10
0	6
2	2
4	-2

- a) $f(x) = -2x + 6$ b) $f(x) = x + 6$ c) $f(x) = -5x$ d) $f(x) = 3x - 4$ e) NOT
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31. If $f(x) = |x + 2|$, then $f(-3) =$

- a) 1 b) -1 c) -5 d) 5 e) NOT
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32. What is an equation for the line in standard form through the points $(3,0)$ and $(-2,3)$?

- a) $3x + 5y = 9$ b) $3x - 5y = -9$ c) $-3x - 5y = 9$ d) $5x + 3y = 9$ e) NOT
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33. Which of the following describes the graph of the solution(s) to the system:

$$2x - 4y = -1 \quad \text{and} \quad x - 2y = 2$$

- a) one line, infinitely many solutions b) two intersecting lines with solution of $(2, 4)$
 c) two parallel lines, no solution d) two intersecting lines with solution $(-1, 2)$ e) NOT
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34. What is the domain of the function $f(x) = \frac{x+5}{x-6}$?

- a) $(-\infty, 6) \cup (6, \infty)$ b) $(-\infty, -5) \cup (-5, \infty)$ c) $(-\infty, -5) \cup (-5, 6) \cup (6, \infty)$
 d) $(-\infty, \infty)$ e) NOT
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35. What is the domain of the function $f(x) = \sqrt{3x}$?

- a) the set of all nonnegative real numbers b) the set of all real numbers except 0
 c) the set of all real numbers d) the set of all real numbers except -3 e) NOT
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36. The graph of which function is *not* a line?

- a) $2x + 4y = 5$ b) $y = 0.6x$ c) $y = 2x^3$ d) $y = 4$ e) all of these are lines
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37. A football stadium has 12,000 seats. The home team h gets five times as many seats as the visiting team v . Which system of equations represents this situation?

- a) $h + v = 12000$
 $h = 5 + v$ b) $h - v = 12000$
 $h + 5 = v$ c) $h + v = 12000$
 $5h = v$ d) $h + v = 12000$
 $5v = h$ e) NOT
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38. The manager of a ski resort is working on two special packages. Plan A would give one person 4 nights lodging and 3 dinners for at most \$315. Plan B would give one person 5 nights lodging and 4 dinners for at most \$400. What is the most one dinner would cost?

- a) \$60 b) \$25 c) \$44.44 d) \$45 e) NOT

39. Simplify: $\frac{n}{5} + \frac{4n+10}{5}$

- a) $\frac{n+2}{2}$ b) $n+2$ c) $\frac{3n+10}{5}$ d) $n+5$ e) NOT

40. Simplify $(t-2)^2$

- a) $t^2 - 4t + 4$ b) $t^2 + 4t + 4$ c) $t^2 + 4t - 4$ d) $t^2 - 4t - 4$ e) NOT

41. Simplify: $-2x(8x-2)$

- a) $6x^2 + 4x$ b) $-16x^2 - 4x$ c) $-16x^2 + 4x$ d) $6x^2 - 4x$ e) NOT

42. Solve: $36 > -3m$

- a) $(-\infty, -12)$ b) $(12, \infty)$ c) $(-12, \infty)$ d) $(-\infty, 12)$ e) NOT

43. Solve: $x^2 - 6x - 27 = 0$

- a) $x = 9$ or $x = -3$ b) $x = -9$ or $x = -3$ c) $x = 9$ or $x = 3$ d) $x = -9$ or $x = 3$ e) NOT

44. The formula for the area of a circle with radius r is $A = \pi r^2$. What is this formula solved for r ?

- a) $r = \frac{A^2}{\pi}$ b) $r = (A\pi)^2$ c) $r = \sqrt{\frac{A}{\pi}}$ d) $r = \sqrt{A\pi}$ e) NOT

45. Solve the following: $|x+5| \leq 3$

- a) $(-\infty, -8] \cup [-2, \infty)$ b) $[-8, -2]$ c) $(-\infty, 8] \cup [2, \infty)$ d) $[2, 8]$ e) NOT

46. What is the solution to the system: $-2x + 3y = 0$ and $x - 3y = -12$

- a) $(-8, -12)$ b) $(8, 12)$ c) $(-12, -8)$ d) $(12, 8)$ e) NOT

47. The formula $V = \sqrt{\frac{Fr}{m}}$ gives the speed V in meters/second of an object moving in a

horizontal circle where F is centripetal force in newtons, r is the radius in meters, and m is the mass of the object in kilograms. Find r when $F = 6$ newtons, $m = 2$ kg, and $V = 3$ m/s.

- a) $\sqrt{3}$ meters b) 1 meter c) 3 meters d) $\frac{\sqrt{2}}{2}$ meters

48. What is the domain of the function $f(x) = \sqrt{8-x}$?

- a) $(-\infty, 8)$ b) $(-\infty, 8]$ c) $(-\infty, \infty)$ d) $(0, \infty)$ e) NOT

49. What is the value of x in the matrix equation?

$$\begin{bmatrix} 5 & 3 \\ 4 & -9 \\ -8 & -4 \end{bmatrix} + \begin{bmatrix} -9 & 0 \\ -6 & -9 \\ 8 & 9 \end{bmatrix} = \begin{bmatrix} -4 & 3 \\ x & -18 \\ 0 & 5 \end{bmatrix} \quad \text{a) } -4 \quad \text{b) } -2 \quad \text{c) } 2 \quad \text{d) } -24 \quad \text{e) NOT}$$

50. Find the solution to the linear system: $x - 3y = -4$ and $2x + y = 6$

- a) $(-3, 2)$ b) $(0, 6)$ c) $(-\frac{2}{7}, 5)$ d) $(2, 2)$ e) NOT

51. Tell without graphing that the following system of linear equations has no solution.

$$y = -5x - 3$$

$$y = -5x + 2$$

- a) they are the same line b) the lines are parallel c) the lines are perpendicular
d) the lines intersect e) NOT
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52. Give an equation for the line perpendicular to $y = -\frac{x}{2} + 3$ through the point $(-4, 1)$.

- a) $-2x + y = 5$ b) $-2x + y = 9$ c) $x + 2y = 6$ d) $x + 2y = -4$ e) NOT
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53. If $f(x) = 9^x$, then $f(2) =$

- a) 11 b) 7 c) 81 d) 18 e) NOT
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54. Which equation describes the numbers in the table?

- a) $y = 5x$ b) $y = x + 4$ c) $y = 5 + x$
d) $y = 5^x$ e) NOT

x	y
0	5
1	6
2	7
3	8
4	9

55. What is the slope of the line through $(-3, 2)$ and $(-4, 1)$?

- a) 1 b) $-\frac{3}{7}$ c) $-\frac{1}{7}$ d) -1 e) NOT
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56. Find the value of y in the solution of the system of equations: $3x + 7y = 15$ and $-5x + 2y = 16$

- a) 3 b) -2 c) 2 d) $6/7$ e) none of these
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57. Two telephone companies are offering new deals to their customers. In addition to a monthly fee of \$6, Company A charges \$0.06 per call. In addition to a monthly fee of \$4, Company B charges \$0.11 per call. Let n = the number of calls.

Give two functions, $A(n)$ and $B(n)$ that represent this situation.

- a) $A(n) = 6n, B(n) = 4n$ b) $A(n) = 6 + 0.06n, B(n) = 4 + 0.11n$
c) $A(n) = 0.6n, B(n) = 0.11n$ d) $A(n) = 0.06 + 6n, B(n) = 0.11 + 4n$ e) NOT
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58. What is the sum of $x^2 - 3x + 5$ and $2x^2 + 7x - 9$?

- a) $2x^2 + 4x - 4$ b) $3x^2 + 4x - 4$ c) $2x^4 + 4x^2 - 4$ d) $3x^4 + 4x^2 - 4$ e) NOT
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59. Which expression must represent a negative number if x is negative?

- a) x^2 b) $4 + x$ c) x^3 d) $-x$ e) NOT
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60. The numbers -9 and $-\frac{1}{9}$ are *not*

- a) real numbers b) additive inverses c) reciprocals
d) multiplicative inverses e) rational numbers
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61. What is a in the following matrix addition problem?

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} + \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix} = \begin{bmatrix} 6 & 8 \\ 10 & a \end{bmatrix} \quad \text{a) } 6 \quad \text{b) } 8 \quad \text{c) } 10 \quad \text{d) } 12 \quad \text{e) } \text{NOT}$$

62. What is b in the following matrix multiplication problem?

$$8 \begin{bmatrix} 3 & 1 \\ 0 & 2 \end{bmatrix} = \begin{bmatrix} b & 8 \\ 0 & 16 \end{bmatrix} \quad \text{a) } 24 \quad \text{b) } 8 \quad \text{c) } 14 \quad \text{d) } 16 \quad \text{e) } \text{NOT}$$

63. Which of these lines is perpendicular to the line passing through $(2, 1)$ and $(-3, 2)$?

a) $y = -\frac{x}{5} + 7$ b) $5x - y = -23$ c) $\frac{5y}{3} = x$ d) $y = -\frac{5x}{2} + 2$ e) NOT

64. Which one of the following describes a function?

a) $\{(2,2), (2,-4)\}$ b) $\{(6,7), (5,7), (7,7)\}$ c) $\{(4,2), (4,3), (4,4), (4,5)\}$
 d) $\{(1,4), (2,5), (3,6), (1,7)\}$ e) NOT

65. Given the following linear system, what are the coordinates of the point of intersection?

$$\begin{aligned} y &= 2x \\ 2x + 3y &= 8 \end{aligned} \quad \text{a) } (-1, -2) \quad \text{b) } (1, 2) \quad \text{c) } (2, 1) \quad \text{d) } (-2, -1) \quad \text{e) } \text{NOT}$$

66. Which of the following increases everywhere at a constant rate?

a) $y = 2x$ b) $y = x^2$ c) $y = -2x$ d) $y = 2^x$ e) NOT

67. Simplify $(w^3 + 2w - 3) - (2w^2 - 1) + (w + 2)$

a) $w^3 + w^2 - w$ b) $2w^3 + 3w^2 - w + 2$ c) $w^3 - 2w^2 + 3w$ d) $w^3 + 2w^2 - 3w - 2$
 e) NOT

68. Solve: $2(8g - 6) = -(2 - g)$

a) $g = \frac{2}{3}$ b) $g = -\frac{2}{3}$ c) $g = \frac{3}{2}$ d) $g = -\frac{3}{2}$ e) NOT

69. Give the solution to $|3x - 2| \geq 5$

a) $(-\infty, -1] \cup \left[\frac{7}{3}, \infty\right)$ b) $\left[\frac{7}{3}, \infty\right)$ c) $[-5, 5]$ d) $(-\infty, 3] \cup [7, \infty)$ e) NOT

70. A line of best fit *cannot* be used to

a) find an equation to describe data b) describe the trend of the data c) predict data
 d) find exact data values e) NOT

71. If $f(x) = mx + b$ then simplify the expression $\frac{f(x+k) - f(x)}{k}$

a) m b) $-m$ c) $m+k$ d) $m+1$ e) NOT

72. The point P lies on the equation $y - 4 = 3(x - 2)$. If the x-coordinate of P is 4, what is the y-coordinate of P?

a) -2 b) 2 c) 4 d) 6 e) NOT

73. Real numbers include

- a) irrational numbers only b) both rational and irrational numbers
 c) rational numbers only d) perfect squares only e) NOT
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74. Evaluate $x(3 + y^2)$ when $x = 0.4$ and $y = 2$.

- a) 23.12 b) 10 c) 6.32 d) 2.8 e) NOT
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75. Which is the single matrix for $\begin{bmatrix} 3 & -3 & 2 & 3 \\ 6 & -13 & 34 & 23 \\ -2 & -34 & 0 & 4 \end{bmatrix} + \begin{bmatrix} -3 & 6 & -34 & 12 \\ 0 & 76 & -23 & 21 \\ 23 & -74 & 41 & 0 \end{bmatrix}$?

a) $\begin{bmatrix} 0 & 3 & -32 & 15 \\ 6 & 63 & 11 & 44 \\ 21 & -108 & 41 & 4 \end{bmatrix}$

b) $\begin{bmatrix} 6 & -9 & 36 & -9 \\ 6 & -89 & 57 & 2 \\ -25 & 40 & -41 & 4 \end{bmatrix}$

c) $\begin{bmatrix} -6 & 9 & -36 & 9 \\ -6 & 89 & -57 & -2 \\ -25 & -40 & 41 & -4 \end{bmatrix}$

d) these matrices cannot be added e) NOT

76. Which is the single matrix for $\begin{bmatrix} 7 & -6 \\ 4 & -3 \end{bmatrix} - \begin{bmatrix} -1 & 1 \\ 9 & -1 \end{bmatrix}$?

a) $\begin{bmatrix} -8 & 7 \\ 5 & 2 \end{bmatrix}$

b) $\begin{bmatrix} 8 & -7 \\ -5 & -2 \end{bmatrix}$

c) $\begin{bmatrix} -6 & 5 \\ -8 & 4 \end{bmatrix}$

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

e) NOT

77. Find a solution to the following system: $x + y = 6$ and $3x - 2y = -5$.

- a) $(\frac{7}{5}, \frac{23}{5})$ b) $(\frac{5}{7}, \frac{23}{5})$ c) $(2, 4)$ d) $(4, 2)$ e) NOT
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78. Find an equation of the line perpendicular to $5x + 6y = 9$ containing the point $(-1, 1)$.

a) $y = \frac{6}{5}x + \frac{11}{5}$

b) $y = -\frac{5}{6}x + \frac{7}{6}$

c) $y = \frac{6}{5}x + \frac{1}{5}$

d) $y = -\frac{5}{6}x - \frac{9}{5}$

e) NOT

79. Water boils at 212°F at sea level (altitude 0 ft), boils at 204.6°F at 4000 ft, boils as 197.2°F at 8000 ft, and boils at 189.8°F at 12000 ft. Find a good linear model relating the boiling temperature t of water to the altitude a .

a) $t = -571a + 212$

b) $t = -.00185a + 212$

c) $t = -.00185a + 204.6$

d) $t = -571a + 204.6$

e) NOT

80. At the Spic-and-Span Car Wash, the charge is \$13 to wash the exterior of a car and \$8 to clean the interior. To make a profit, the total revenue from washing exteriors and cleaning interiors on a given day should be at least \$700. Let E be the number of exteriors washed and I be the number of interiors cleaned in one day. Which of the following inequalities describes the situation?

a) $13E + 8I \geq 700$

b) $13E + 8I \leq 700$

c) $E + I \geq 700$

d) $8E + 13I \geq 700$

e) NOT

81. Which linear equation fits the data best: $(-4, -1)$, $(-3,0)$, $(-1,0)$, $(1,2)$, $(3,2)$, $(4,3)$?

- a) $y = \frac{1}{2}x + 1$ b) $y = 1$ c) $y = x$ d) $y = 2x - 2$ e) $y = 2x + 1$
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82. Which of these inequalities has a solution that is different from the others?

- a) $2x - 3 \leq 11$ b) $5 - 3x \geq -16$ c) $3x - 5 \geq 16$ d) $22 - 2x \geq 2x - 6$
 e) they all have the same solution
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83. Simplify: $(2x^5 + 4x^4 - 3x - 10) - (x^5 - 2x^4 - 3x^2 + 5)$

- a) $x^5 + 6x^4 + 3x^2 - 3x - 15$ b) $2x^5 + 2x^4 - 3x^2 + 5$
 c) $-x^5 - 2x^4 - 3x + 15$ d) $3x^5 - 6x^4 - 3x^2 + 3x - 5$ e) NOT
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84. What is the standard form then polynomial $(6x + 7)^2$?

- a) $36x^2 + 42x + 49$ b) $12x^2 + 42x + 14$ c) $36x^2 + 84x + 49$ \ d) $12x^2 + 84x + 14$ e) NOT
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85. Complete the following scalar multiplication: $3 \begin{bmatrix} 3 & 3 \\ 0 & 4 \end{bmatrix}$

- a) $\begin{bmatrix} 9 & 12 \\ 9 & 0 \end{bmatrix}$ b) $\begin{bmatrix} -3 & 1 \\ 12 & 4 \end{bmatrix}$ c) $\begin{bmatrix} -3 & 0 \\ 3 & 4 \end{bmatrix}$ d) $\begin{bmatrix} 3 & 0 \\ 0 & 0 \end{bmatrix}$ e) NOT
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86. $\begin{bmatrix} 3 & 1 \\ 2 & 4 \\ 11 & 0 \end{bmatrix} + \begin{bmatrix} 7 & 4 \\ 9 & 0 \\ 3 & 45 \end{bmatrix} = ?$

- a) $\begin{bmatrix} 10 & 5 & 11 \\ 4 & 14 & 45 \end{bmatrix}$ b) $\begin{bmatrix} 10 & 1 \\ 11 & 4 \\ 14 & 0 \end{bmatrix}$ c) $\begin{bmatrix} 10 & 5 \\ 11 & 4 \\ 14 & 45 \end{bmatrix}$ d) $\begin{bmatrix} 10 & 1 & 11 \\ 4 & 14 & 0 \end{bmatrix}$ e) NOT
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87. Find the slope-intercept form of the equation of the line perpendicular to

$-4x + 4y = 4$ through the point $(9, 8)$.

- a) $y = x + 1$ b) $y = -x + 1$ c) $y = -x + 17$ d) $y = x + 17$ e) NOT
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88. Find the fifth term of the expansion: $(x + y)^7$

- a) $7x^4y^3$ b) $35x^3y^4$ c) $21x^5y^2$ d) $35x^6y$ e) NOT
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89. What is the slope of the line parallel to $3x - 4y = 4$ that passes through the origin?

- a) 0 b) $\frac{3}{4}$ c) $-\frac{4}{3}$ d) 2 e) NOT

90. A river crested at 22 feet above flood stage. Then the water began to recede at the rate of 0.5 feet per hour. Which equation relates the number of feet h above flood stage to the number of hours t that the water has been receding?

- a) $h = 0.5t - 22$ b) $h = 22 + 0.5t$ c) $h = 22 - 0.5t$ d) $t = 22 - 0.5h$ e) NOT

91. Which of the following inequalities would have the same graph?

- I $x > 4$ II $-3x < -12$ III $x + 1 > 3$ IV $12 < 2x + 4$

- a) I and II only b) II and III only c) I, II, and III only
d) II, III, and IV only e) NOT

92. Solve the system: $a + b = 1$ and $a + 2b = 2$

- a) (1, 1) b) (0, 1) c) (1, 0)
d) (2, 2) e) NOT

93. The table shows the relationship between calories and fat in fast-food hamburgers.

Hamburger

	A	B	C	D	E	F	G	H	I
Calories	720	530	510	500	305	410	440	320	590
Fat (in grams)	46	30	27	26	13	20	25	13	26

Develop a _____ linear model for the relationship between calories and fat.

- a) $y = 1.07x - 93$ b) $y = 0.07x - 9.3$ c) $y = -0.07x + 9.3$ d) $y = -1.07x + 93$
e) NOT

94. Simplify $(w + 2) - (3w + 7)$

- a) $w = 2$ b) $-2w - 5$ c) $4w + 9$ d) $-2w + 9$ e) NOT

-
- 95) Find the determinant of the matrix $\begin{bmatrix} 3 & -1 \\ 6 & 2 \end{bmatrix}$
- A) 12 B) -12 C) 0 D) 9 E) none of these
-
- 96) If $A = B \cdot C^2$ then how is the value of A changed if B is doubled and C is tripled?
- a) A is doubled b) A is tripled c) A is multiplied by 6
d) A is multiplied by 12 e) NOT
-
- 97) The sum of the digits of a two digit number is 12. If the order of the digits is reversed, the new number exceeds the old number by 54. Find the original number.
- a) 39 b) 93 c) 54 d) 66 e) NOT
-
98. If $f(x) = cx$ and $f(f(x)) = 4x$, then $c =$
- (a) ± 2 (b) ± 3 (c) 4 (d) $\frac{1}{2}$ (e) none of these
-
99. Find the maximum value of the objective function $z = 3x + 2y$ subject to the following constraints: $x \geq 0$, $y \geq 0$, $x + y \leq 4$, and $x + 3y \leq 6$.
- (a) 12 (b) 11 (c) 10 (d) 9 (e) none of these
-
100. The lines with equations $y = m_1x + 4$ and $y = m_2x + 3$ intersect to the right of the y-axis if and only if:
- A) $m_1 = m_2$ B) $m_1 < m_2$ C) $m_1 > m_2$ D) $m_1 + m_2 = 0$ E) $m_1 \neq m_2$
-
101. If $f(x) = \frac{1}{2}x - 4$ and $f(g(x)) = g(f(x))$ then which of the following could be $g(x)$?
- I $g(x) = 2x - \frac{1}{4}$ II $g(x) = 2x + 8$ III $g(x) = \frac{1}{2}x - 4$
- A) I only B) II only C) III only D) II and III only E) I, II, and III
-
102. Solve the linear system: $7x - 3y = 26$
 $2x + 5y = 25$
- A) $(-5, -\frac{61}{3})$ B) $(5, 3)$ C) infinitely many solutions D) no solution E) none of these
-
103. Solve the linear system: $2x + 4y = 7$
 $3x + 6y = 5$
- A) $(1, \frac{5}{4})$ B) $(0, 0)$ C) infinitely many solutions D) no solution E) none of these
-
104. Solve the system: $x - 6y + z = 1$
 $-x + 2y - 4z = 3$
 $7x - 10y + 3z = -25$
- A) $(5, 1, 2)$ B) $(-5, -1, 0)$ C) $(-1, 3, 1)$ D) no solution E) none of these
-
105. Solve the system: $x - y + z = 5$
 $3x + 2y - z = -2$
 $2x + y + 3z = 10$
- A) $(1, -1, 3)$ B) $(2, -5, -2)$ C) $(-1, 7, 13)$ D) $(3, -9, -7)$ E) none of these
-

106. Which of the following is a reflection of the graph of $y = f(x)$ across the x-axis?

- A. $y = -f(x)$ B. $y = f(-x)$ C. $y = |f(x)|$ D. $y = f(|x|)$ E. $y = -f(-x)$

107. If $\frac{x}{3} = x^2$, then the value of x can be which of the following:

- I. $-\frac{1}{3}$ II. 0 III. $\frac{1}{3}$

- a) I only b) II only c) III only d) II and III only e) I, II, and III

108. For pumpkin carving, Mr. Shah will not use pumpkins that weigh less than 2 pounds or more than 10 pounds. If x represents the weight, in pounds, he will NOT use, which of the following represents all possible values of x ?

- a) $|x - 2| > 10$ b) $|x - 4| > 6$ c) $|x - 5| > 5$ d) $|x - 6| > 4$ e) $|x - 10| > 4$

109. If $2^{2x} = 8^{x-1}$ what is the value of x ? a) 2 b) 3 c) 4 d) 5 e) 6

110. If $x^2 + y^2 = 73$ and $xy = 24$, what is the value of $(x + y)^2$?

- a) 73 b) 97 c) 100 d) 121 e) 144

111. If $f(x) = \frac{3-2x^2}{x}$ for all nonzero x , then $f(2) =$

- a) $\frac{11}{2}$ b) $\frac{7}{2}$ c) $-\frac{1}{2}$ d) $-\frac{5}{2}$ e) -7

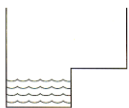
112. In the xy -plane, the line with equation $y = 5x - 10$ crosses the x-axis at the point with coordinates (a, b) . What is the value of a ?

- a) -10 b) -2 c) 0 d) 2 e) 5

113. During a sale, a customer can buy one shirt for x dollars. Each additional shirt the customer buys costs z dollars less than the first shirt. For example, the cost of the second shirt is $x - z$ dollars. Which of the following represents the customer's cost, in dollars, for n shirts bought during this sale?

- a) $x + (n-1)(x-z)$ b) $x + n(x-z)$ c) $n(x-z)$
 d) $\frac{x+(x-z)}{n}$ e) $(x-z) + \frac{(x-z)}{n}$

114. A cross-section of a storage tank, showing its depth, is shown below.



As it is filled with water at a constant rate, the graph of the depth of the water over time would look like which of the following?

- a) b) c) d) e) NOT