Trig Midterm Review 2017-18

Name _____

_____1. Simplify $2(2n + 4) – (6n – 2)$

A. $-2n +10$ B. $-2n – 10$ C. $2n – 10$ D. $2n + 10$

_____2. Simplify $(2n^3 + 5n)(4n^3 + 2n)$

A. $8n^6 + 24n^4 + 10n^2$ B. $8n^9 + 24n^4 + 10n^2$

C. $8n^6 + 20n^3 + 10n$ D. $8n^9 + 24n^3 + 10n^2$

_____3. Simplify $(x + 2)(x + 2)(x + 2)$

A. $x^3 + 8$ B. $x^3 + 6x^2 + 4x + 12$

C. $x^3 + 6x^2 + 12x + 8$ D. $x^3 + 8x^2 + 12x + 8$

_____4. Simplify $\sqrt{20a^5y^{10}}$

A. $2a^2y^5\sqrt{5a}$ B. $5ay^5\sqrt{2a}$ C. $2ay^5\sqrt{5a}$ D. $5ay^5\sqrt{2ay}$

_____5. Solve by factoring: $x^2 – x – 20 = 0$

A. $x = -5$ or $x = 4$ B. $x = 5$ or $x = -4$

C. $x = 5$ or $x = 4$ D. $x = -5$ or $x = -4$

_____6. Simplify $\sqrt{120}$

A. 60 B. $2\sqrt{30}$ C. $2\sqrt{40}$ D. $4\sqrt{10}$

_____7. Simplify $\dfrac{9 \pm \sqrt{18}}{3}$

A. $3 \pm i\sqrt{3}$ B. $3 \pm i\sqrt{2}$ C. $3 \pm \sqrt{3}$ D. $3 \pm \sqrt{2}$

_____8. Solve for n: $4(2n + 5) + 2(3n + 5) = 10n + 22$

A. $n = -4$ B. $n = \dfrac{1}{2}$ C. $n = -2$ D. $n = 2$

_____9. Simplify $(3n^2y^4)^2 + n(n^4)y^3y^5$

A. $10n^4y^8$ B. $10n^5y^8$ C. $7n^5y^8$ D. None of the above

_____10. Simplify $\dfrac{a^4b^{10}c^5}{ab^8c^7}$

A. $\dfrac{a^3b^2}{c}$ B. $\dfrac{ab^2}{c^2}$ C. $\dfrac{a^3}{b^2c^2}$ D. None of the above

_____11. Simplify $\dfrac{n^2+4n+3}{n^2+7n+12}$

A. $\dfrac{n+3}{n+4}$ B. $\dfrac{1}{n+4}$ C. $\dfrac{1}{3n+4}$ D. $\dfrac{n+1}{n+4}$

_____12. Perform the following division $n-2\overline{)n^2+3n+1}$

A. $n+5+\frac{11}{n-2}$ B. $n+5+\frac{9}{n-2}$ C. $n+1+\frac{1}{n-2}$ D. $n+1+\frac{-3}{n-2}$

_____13. $\left(\frac{2}{3}\right)^{-3}$ **NO CALCULATOR ALLOWED!**

A. $\frac{6}{27}$ B. $\frac{8}{27}$ C. $\frac{27}{8}$ D. $-\frac{8}{27}$

_____14. Simplify $\left(\frac{n^2y^{-2}}{a^{-4}}\right)^2$

A. $\frac{n^4y^4}{a^{16}}$ B. $\frac{n^4y^4}{a^8}$ C. $\frac{n^4a^{16}}{y^4}$ D. $\frac{n^4a^8}{y^4}$

_____15. Simplify $\left(\frac{2a^3}{5b^2}\right)^{-2}$

A. $\frac{25b^4}{4a^6}$ B. $\frac{4b^4}{25a^6}$ C. $\frac{25a^6}{4b^4}$ D. $\frac{25a^6b^4}{4}$

_____16. Factor $16a^4b^2+20ab^5$

A. $ab^2(16a^3 + 20b^3)$ B. $ab(16a^3b + 20b^4)$
C. $4ab^2(4a^3 + 5b^3)$ D. None of the above

_____17. Factor $8n^3 + 27y^3$

A. $(2n + 3y)(4n^2 + 6ny + 9y^2)$ B. $(2n + 3y)(4n^2 – 6ny + 9y^2)$
C. $(2n – 3y)(4n^2 + 6ny + 9y^2)$ D. $(2n + 3y)(4n^2 – 6ny – 9y^2)$

_____18. Factor $3n^3 + 12n^2 + 2n + 8$

A. $(n + 2)(3n^2 + 4)$ B. $(3n + 4)(n^2 + 2)$
C. $(3n + 2)(n^2 + 4)$ D. $(n + 4)(3n^2 + 2)$

_____19. Factor $y^5 + 3y^3 + 4y^2 + 12$

A. $(y^2 + 4)(y^3 + 3)$ B. $(y^2 + 3)(y^3 + 4)$ C. $(y^4 + 3)(y + 4)$ D. $(y + 3)(y^5 + 4)$

_____20. If f(x) = 3x – 1 and g(x) = 2x – 1, what is f(g(2))?

A. 8 B. 9 C. 14 D. 13

_____21. If f(x) = 3x – 10 and g(x) = 2x + 1, what is f(g(x))?

A. 6x – 19 B. 6x – 13 C. 6x + 13 D. 6x – 7

_____22. What is the domain of f(x) = $\sqrt{x-3}$?

A. $x \neq 3$ B. $x > 3$ C. $x \geq 3$ D. None of the above

_____23. What is the domain of f(x) = $\frac{x^3}{x-3}$?

A. $x \neq 3$ B. $x > 3$ C. $x \geq 3$ D. None of the above

_____24. What is the domain of $f(x) = x^2 - 9$?

A. $x \neq 3$ B. $\mathbb{R}$ C. $x \geq 3$ D. $x > 3$

_____25. $\sum_{n=-2}^{1} 2n - 1$?

A. -10 B. -9 C. -8 D. -6

_____26. What is the slope from (1, 4) to (3, 10)?

A. 6 B. 2 C. 3 D. -2

_____27. What is the slope from (n, 6) to (n + 2, 7)?

A. 1 B. $\frac{1}{2}$ C. 0 D. 2

_____28. What is the distance from (-3,-2) to (1, -6)?

A. $4\sqrt{2}$ B. $3\sqrt{2}$ C. $2\sqrt{3}$ D. $2\sqrt{2}$

_____29. Which equation below is not in standard form?

A. 3x – y = 5 B. 4x + y = -3 C. -2x + y = 9 D. x – y = -1

_____30. Which is the equation of the line with a slope of 4 and that goes through (2, 5)?

A. y = -4x – 3 B. y = 4x – 3 C. y = 4x + 3 D. y = -4x + 3

_____31. Which is the equation of the line that goes through (1, 4) and (3, 10)?

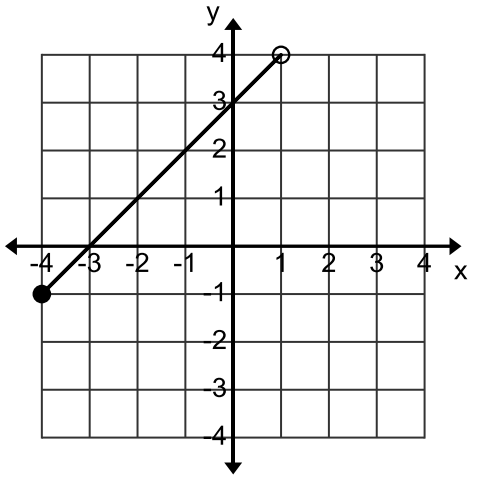
A. y = 3x – 2 B. y = 3x + 2 C. y = 3x + 10 D. y = 3x + 1

_____32. Which is the equation that is parallel to y = 3x – 5 and goes through (3, 4)?

A. y = 3x – 1 B. y = 3x – 2 C. y = 3x + 1 D. y = 3x – 5

_____33. Which is the equation that is perpendicular to y = -2x + 4 and goes through (4, 1)?

A. $y = \frac{1}{2}x + 1$ B. $y = 2x - 7$ C. $y = -\frac{1}{2}x + 1$ D. $y = \frac{1}{2}x - 1$



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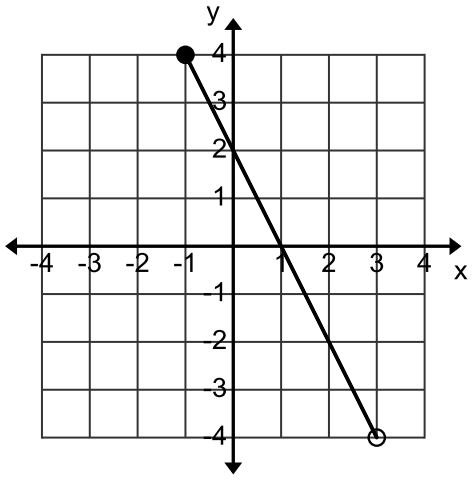


II

_____34. What is the **domain** of the graph I above?
A. $\mathbb{R}: -1 < x \le 4$ B. $\mathbb{R}: -1 \le x < 4$ C. $\mathbb{R}: -4 < x \le 1$ D. $\mathbb{R}: -4 \le x < 1$

_____35. What is the **range** of the graph I above?
A. $\mathbb{R}: -1 < y \le 4$ B. $\mathbb{R}: -1 \le y < 4$ C. $\mathbb{R}: -4 < y \le 1$ D. $\mathbb{R}: -4 \le y < 1$

_____36. What is the **domain** of the graph II above?
A. $\mathbb{R}: -1 < x \le 3$ B. $\mathbb{R}: -1 \le x < 3$ C. $\mathbb{R}: -4 < x \le 4$ D. $\mathbb{R}: -4 \le x < 4$

_____37. What is the **range** of the graph II above?
A. $\mathbb{R}: -1 < y \le 3$ B. $\mathbb{R}: -1 \le y < 3$ C. $\mathbb{R}: -4 < y \le 4$ D. $\mathbb{R}: -4 \le y < 4$

A. $\begin{cases} y = 3x - 5 \\ y = 2x - 1 \end{cases}$ B. $\begin{cases} y = 3x - 1 \\ y + x = 15 \end{cases}$ C. $\begin{cases} 2x + 3y = 8 \\ 4x + 2y = 12 \end{cases}$ D. $\begin{cases} 2x - y = 8 \\ 3x + y = 12 \end{cases}$

_____38. What is the value of y in System A above.
A. y = 11 B. y = 7 C. y = 6 D. None of the above

_____39. What is the value of y in System B above.
A. y = 10 B. y = 4 C. y = 6 D. None of the above

_____40. What is the value of y in System C above.
A. y = 1 B. y = 2 C. y = 7 D. None of the above

_____41. What is the value of y in System D above.
A. y = 1 B. y = 4 C. y = 2 D. None of the above

$A=\begin{bmatrix}2 & 3\\ 2 & 4\end{bmatrix}$ $B=\begin{bmatrix}3 & -2\\ -1 & -4\end{bmatrix}$ $C=\begin{bmatrix}2 & 3\\ 5 & 9\end{bmatrix}$ $D=\begin{bmatrix}2 & 3 & 1\end{bmatrix}$ $E=\begin{bmatrix}3\\ 4\\ 2\end{bmatrix}$

_____42. What is the A + B? **NO CALCULATOR ALLOWED!**

A. -2 B. 4 C. 2 D. None of the above

_____43. What is 3A? **NO CALCULATOR ALLOWED!**

A. $\begin{bmatrix}6 & 9\\ 6 & 12\end{bmatrix}$ B. $\begin{bmatrix}6 & 9\\ 6 & 15\end{bmatrix}$ C. $\begin{bmatrix}6 & 9\\ 8 & 12\end{bmatrix}$ D. None of the above

_____44. What is AB? **NO CALCULATOR ALLOWED!**

A. $\begin{bmatrix}3 & -8\\ 2 & -20\end{bmatrix}$ B. $\begin{bmatrix}3 & -16\\ 2 & -12\end{bmatrix}$ C. $\begin{bmatrix}6 & -6\\ -2 & -16\end{bmatrix}$ D. None of the above

_____45. What is BC? **NO CALCULATOR ALLOWED!**

A. $\begin{bmatrix}2 & 1.5\\ -1 & 1\end{bmatrix}$ B. $\begin{bmatrix}2 & .5\\ 1 & -1\end{bmatrix}$ C. $\begin{bmatrix}2 & 1.5\\ -1.5 & 1\end{bmatrix}$ D. None of the above

_____46. What is DE? **NO CALCULATOR ALLOWED!**

A. $\begin{bmatrix}8\end{bmatrix}$ B. $\begin{bmatrix}18\end{bmatrix}$ C. $\begin{bmatrix}20\end{bmatrix}$ D. None of the above

_____47. What is the domain of f(x) = $\sqrt{x+6}$?

A. $x \neq -6$ B. $x > -6$ C. $x \geq -6$ D. $\mathbb{R}$

_____48. What is the domain of f(x) = $\frac{2x}{2x-6}$?

A. $x \neq 3$ B. $x > 3$ C. $x \geq 3$ D. $\mathbb{R}$

_____49. What is the domain of f(x) = $\sqrt{10-x}$?

A. $x \neq 10$ B. $x \leq 10$ C. $x \geq 10$ D. $\mathbb{R}$

_____50. What is the domain of f(x) = $\sqrt{-2x+4}$?

A. $x \neq 2$ B. $x \leq 2$ C. $x \geq 2$ D. $\mathbb{R}$

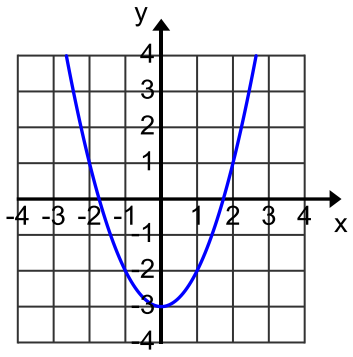
_____51. Simplify $5n - (2n - 4) - (n + 1)$

A. 2n + 3 B. 2n + 5 C. 2n – 3 D. 2n – 5

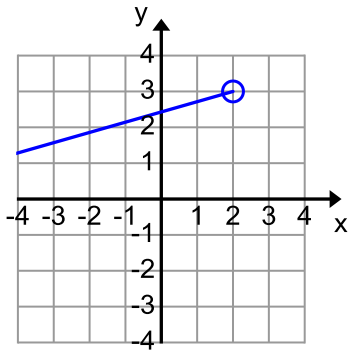
_____52. If A is a 4 x 5 matrix, B a 4 x 3 matrix, and C a 3 x 5 matrix, what matrices could be multiplied?

A. A and B B. A and C C. B and C D. All of them could b

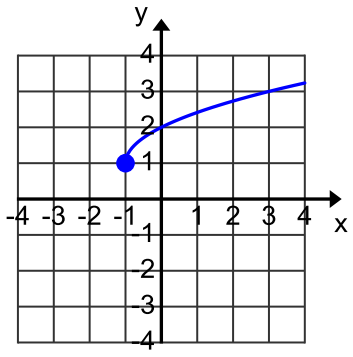
Graph 1



Graph 2



Graph 3



_____53. What is the domain of graph 1 above?
A. $x > -3$ B. $x < -3$ C. $x \geq -3$ D. $\mathbb{R}$

_____54. What is the range of graph 1 above?
A. $y > -3$ B. $y < -3$ C. $y \geq -3$ D. $\mathbb{R}$

_____55. What is the domain of graph 2 above?
A. $x < 3$ B. $x > 3$ C. $x > 2$ D. $x < 2$

_____56. What is the domain of graph 3 above?
A. $x \geq -1$ B. $x < -1$ C. $x \geq 1$ D. $\mathbb{R}$

_____57. What is the range of graph 3 above?
A. $y \geq -1$ B. $y < -1$ C. $y \geq 1$ D. $\mathbb{R}$

_____58. $\sum_{n=-2}^{0} n^2$?
A. -1 B. 5 C. 8 D. 0

_____59. $\sum_{n=-2}^{3} 2-n$?
A. 9 B. 11 C. 12 D. 13

_____60. From the 40 shirts I have, I must pick 5 to plan out my week of teaching. How many different looks would I have next week?
A. 65,800 B. 658,008 C. 78,960,960 D. 789,609,600

_____61. From the 20 kids in the class, I must pick 2 to represent my homeroom as Class Officers. How many possibilities exist?
A. 80 B. 190 C. 380 D. 720

_____62. If a student body has 82 students, in how many different ways could the class elect a President, Vice President, and Secretary?
A. 72,000 B. 88,560 C. 322,240 D. 531,360

_____63. I have a safe in my house that has a key pad on it with the digits 0 – 9 on it. If my combination is a 5 digit code, how many possible combinations exist?

A. 252 B. 67,000 C. 100,000 D. 212,540

_____64. Old VA license plates used to be 3 letters followed by 3 numbers. How many license plates could the state make in this manner?

A. Between 1 – 100,000 B. Between 100,001 – 1,000,000
C. Between 1,000,001- 20,000,000 D. Over 20,000,000

_____65. How many 5 card hands can be dealt from a deck of cards? (For you non-card people, there are 52 cards in a deck.)

A. Between 1 – 1,000,000 B. Between 1,000,001 – 5,000,000
C. Between 5,000,001 – 10,000,000 D. Over 10,000,000

_____66. There are 10 girls and 8 boys up for the "Hickam Award." In how many ways can 2 girls and 3 boys be selected to receive this prestigious award?

A. 101 B. 212 C. 2520 D. 3620

_____67. Simplify $\sqrt[4]{a^8b^2c^{13}}$

A. $ac^3\sqrt[4]{b^2c}$ B. $a^2c^3\sqrt[4]{b^2c}$ C. $a^2bc^3\sqrt[4]{c}$ D. $a^2c^2\sqrt[4]{b^2c^2}$

_____68. Solve $x^3 + 6x^2 + 5x = 0$

A. x = 0 or x = -3 or x = -2 B. x = 0 or x = 5 or x = 1
C. x = 0 or x = -5 or x = -1 D. x = 0 or x = 3 or x = 2

_____69. If f(x) = 2x and g(x) = 5x + 10, what is f(g(x))?

A. 10x + 10 B. 10x + 20 C. 20x + 10 D. 10x – 10

_____70. What would the slope of the line that is perpendicular to 2x – 4y = 10 be?

A. 2 B. -2 C. ½ D. – ½

_____71. Which equation below is the quadratic equation?

A. $x = \frac{b \pm \sqrt{b^2 - 4ac}}{2a}$ B. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2c}$ C. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

_____72. Factor $a^3 + 4a + 5a^2 + 20$

A. $(a^2 + 4)(a + 5)$ B. $(a^2 + 5)(a + 4)$ C. $(2a^2 + 5)(a + 4)$ D. None of the above

_____73. Factor $5a^2 + 10a^3$

A. $5(a^2 + 2a)$ B. $5a(a + 2a^2)$ C. $5a^2(2a)$ D. $5a^2(1 + 2a)$

_____74. What is the approximate distance from (1, 4) and (3, 10)?

A. 6.3 B. 7.8 C. 11.2 D. None of the above

_____75. What is the equation of the line, in slope intercept form, that goes through the point (8, 4) and has a slope of -1.

A. y = -x – 8 B. y = -x + 4 C. y = -x + 12 D. None of the above

_____76. Give the equation of the line in standard form that is perpendicular to y = -4x – 5 and passes through the point (-8, 2).

A. x – 4y = -16 B. 2x + 4y = -8 C. x + 8y = 8 D. None of the above

_____77. Which equation below is **not** in slope intercept form?

A. y = -2x + 6 B. y = ½ x - 5 C. -y = 2x + 6 D. y = 4x

_____78. Give the equation of the line in standard form that is parallel to 12x + 2y = 8 and passes through the point (-1, 2).

A. 6x – y = -8 B. 6x + y = -4 C. 6x – 2y = -10 D. None of the above

_____79. $\sum_{n=2}^{4}(2^n - 10)^n$

A. 1232 B. 1324 C. 1346 D. None of the above

_____80. $\frac{96!}{94!4!}$

A. 96 B. 360 C. 480 D. None of the above

_____81. $\frac{76!}{74!3!}$

A. 450 B. 950 C. 1050 D. None of the above

_____82. $\frac{215!}{213!}$

A. 23,220 B. 46, 010 C. 52,300 D. None of the above

_____83. My password to log on to my computer can be any letter or digit. If I have a passcode that is 3 characters long, how many possibilities for a passcode are there?

A. 4,666 B. 7,140 C. 71,400 D. 46,656

_____84. How many different ways can one answer a 10 question multiple choice test that has options A, B, C, and D?

A. 210 B. 2520 C. 5040 D. None of the above

_____85. Pizza Boy offers a large 3 topping pizza for $13.99 If they have 20 toppings from which you can choose, how many different possibilities can you make assuming you choose 3 different toppings?

A. 1140 B. 6840 C. 9240 D. None of the above

_____86. Perform the following division $n-5\overline{)n^2+n-1}$

A. $n+6+\frac{29}{n-5}$ B. $n+6+\frac{-31}{n-5}$ C. $n-4+\frac{-21}{n-5}$ D. $n-4+\frac{19}{n-5}$

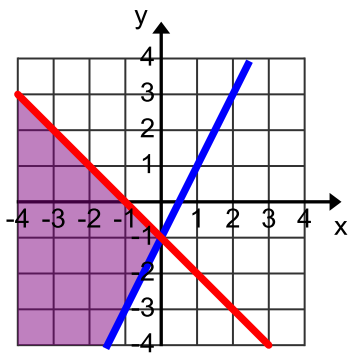
_____87. Simplify $\sqrt[3]{x^4y^{10}}$

A. $xy^4\sqrt[3]{xy}$ B. $xy^3\sqrt[3]{xy^2}$ C. $xy^3\sqrt[3]{xy}$ D. $xy\sqrt[3]{y}$

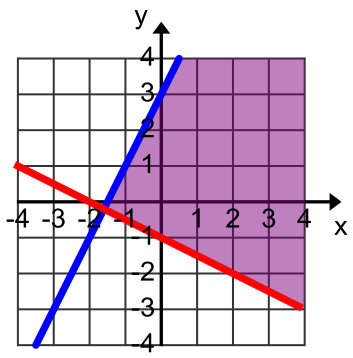
_____88. Perform the following division $n-2\overline{)n^2+3n-1}$

A. $n+5+\frac{-11}{n-2}$ B. $n+5+\frac{9}{n-2}$ C. $n+1+\frac{1}{n-2}$ D. $n+1+\frac{-3}{n-2}$

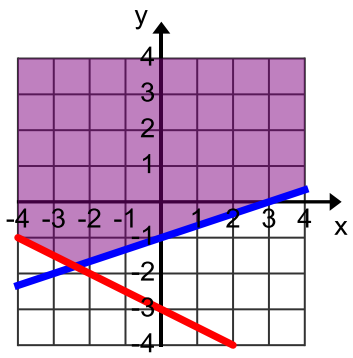
Graph 1



Graph 2



Graph 3



For 89-91, tell what is graphed in the system of inequalities above.

_____89. Graph 1 A. $\begin{cases} y \geq 2x+1 \\ y \leq -x-1 \end{cases}$ B. $\begin{cases} y > 2x-1 \\ y \leq -x-1 \end{cases}$ C. $\begin{cases} y \geq 2x-1 \\ y < -x-1 \end{cases}$ D. $\begin{cases} y > 2x+1 \\ y \leq -x-1 \end{cases}$

_____90. Graph 2 A. $\begin{cases} y \leq 2x+3 \\ y > -\frac{1}{2}x-1 \end{cases}$ B. $\begin{cases} y < 2x+3 \\ y \geq -\frac{1}{2}x-1 \end{cases}$ C. $\begin{cases} y \leq 2x+3 \\ y > -2x-1 \end{cases}$ D. $\begin{cases} y < -2x+3 \\ y \geq -\frac{1}{2}x-1 \end{cases}$

_____91. Graph 3 A. $\begin{cases} y > 3x-1 \\ y \geq -\frac{1}{2}x-3 \end{cases}$ B. $\begin{cases} y > \frac{1}{3}x-1 \\ y \geq -\frac{1}{2}x-3 \end{cases}$ C. $\begin{cases} y > -\frac{1}{3}x-1 \\ y \geq -\frac{1}{2}x-3 \end{cases}$ D. $\begin{cases} y < 3x-1 \\ y \geq -\frac{1}{2}x-3 \end{cases}$

_____92. $\begin{bmatrix} -2 & 5 \end{bmatrix} \bullet \begin{bmatrix} 2 & 1 & 0 \\ -1 & 2 & 3 \end{bmatrix}$

A. $\begin{bmatrix} -1 & -12 & 15 \end{bmatrix}$ B. $\begin{bmatrix} -9 & 8 & 15 \end{bmatrix}$ C. $\begin{bmatrix} -1 & 8 & 12 \end{bmatrix}$ D. $\begin{bmatrix} -9 & 8 & 12 \end{bmatrix}$

Figure 1	Figure 2	Figure 3

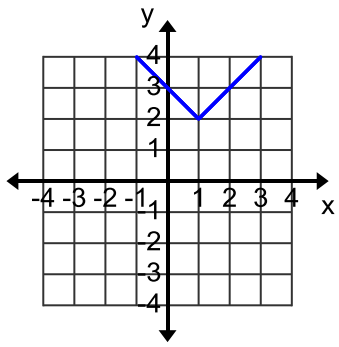
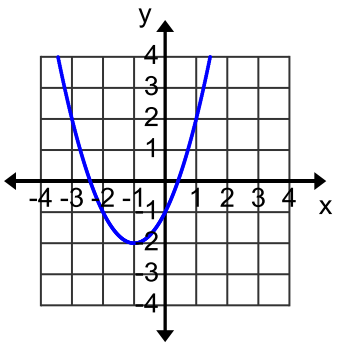
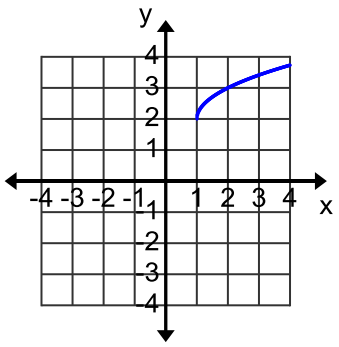
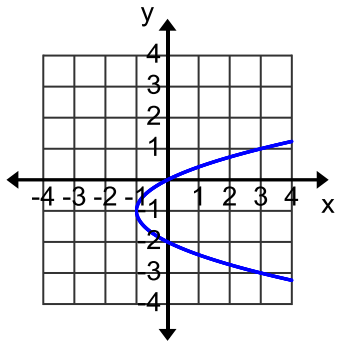
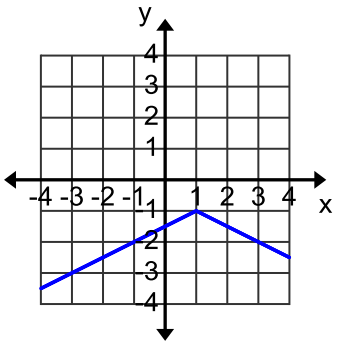
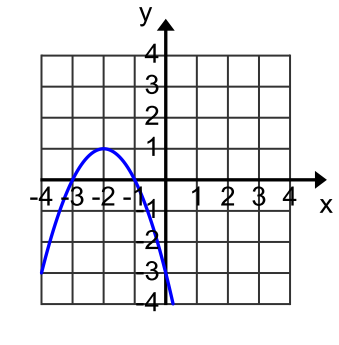

		

Figure 4	**Figure 5**	**Figure 6**
		

_____93. What equation is graphed in figure 1 above.

A. $y=|x-1|-2$ B. $y=|x+1|+2$ C. $y=|x-1|+2$ D. $y=|x-1|^2+2$

_____94. What equation is graphed in figure 2 above.

A. $y=(x+1)^2-2$ B. $y=(x-1)^2-2$ C. $y=(x+1)^2+2$ D. $y=(x-1)^2+2$

_____95. What equation is graphed in figure 3 above.

A. $y=\pm\sqrt{x+1}+2$ B. $y=\sqrt{x+1}+2$ C. $y=\pm\sqrt{x-1}-2$ D. $y=\sqrt{x-1}+2$

_____96. What equation is graphed in figure 4 above.

A. $y=\pm\sqrt{x+1}-1$ B. $y=-\sqrt{x+1}-1$ C. $y=\sqrt{x+1}-1$ D. $y=\pm\sqrt{x-1}-1$

_____97. What equation is graphed in figure 5 above.

A. $y=-\frac{1}{2}|x-1|-1$ B. $y=\frac{1}{2}|x+1|-1$ C. $y=-\frac{1}{2}|x+1|-1$ D. $y=\frac{1}{2}|x-1|+1$

_____98. What equation is graphed in figure 6 above.

A. $y=(x+2)^2+1$ B. $y=-(x-2)^2+1$ C. $y=-(x+2)^2+1$ D. $y=-(x-2)^2-1$

_____99. $|x-1|>5$

A. x > 6 or x <-4 B. -4 < x < 6
C. x > -4 or x < 6 D. -4 > x > 6

_____100. $|2x+3|<9$

A. x > 3 or x <-6 B. -6 < x < 3
C. x > -6 or x < 3 D. None of the above

_____101. $|x-5|>9$

A. x > 14 or x <-4 B. -4 < x < 14
C. x > -4 or x < 14 D. None of the above

_____102. $|2x-1|>-9$

A. x < 5 or x > -4 B. -4 < x < 14
C. x > 4 or x < -5 D. None of the above

_____103. What is the horizontal asymptote of $y=\frac{3x^5+2}{4x^2+2x+1}$?

A. None exist B. y = 0 C. $y=\frac{3}{4}$ D. y = 3

_____104. What is the horizontal asymptote of $y=\frac{4x^3+5}{4x^3+1}$?

A. y = 0 B. $y=\frac{1}{2}$ C. y = 1 D. No horizontal asymptote

_____105. What is the horizontal asymptote of $y=\frac{2x^3+5}{3x^2+1}$?

A. y = 0 B. $y=\frac{2}{3}$ C. y = 1 D. No horizontal asymptote

_____106. What is the vertical asymptote of $y=\frac{2x^3+5}{x+4}$?

A. x = 4 B. x= -4 C. x = 2 D. No vertical asymptote

_____107. What is the vertical asymptote of $y=\frac{2x^3+5}{x^2-4}$?

A. x = 2 B. x= 4 C. x = ±2 D. No vertical asymptote

_____108. What is the slant asymptote of $y=\frac{2x^2+3x+1}{x+2}$?

A. y = 2x – 3 B. y = 2x + 1 C. y = 2x - 2 D. y = 2x – 1