Name _____ Block _____ School_____

Algebra 2 DISTRICT COMMON ASSESSMENT 4

Directions: Show all work on this paper. When completed, transfer your answers online.

1. R varies inversely with x. If R = −2 when x = 6, what is the value of R when x = −3?

a) −1
b) 4
c) −4
d) 1

2. What are the horizontal and vertical asymptotes of the graph of $y = \frac{x^2 - x - 6}{14 - 9x + x^2}$?

a) $y = 3; x = 5; x = 2$
b) $y = 1; x = 7; x = 2$
c) $y = 6; x = 7; x = 4$
d) $y = 1; x = 6; x = 2$

3. Describe the transformations needed to translate the graph of $y = \frac{1}{x}$ to the graph of $y = \frac{1}{x+1} - 3$.

a) To the right 1 and down 3
b) To the right 1 and up 3
c) To the left 1 and down 3
d) To the left 1 and up 3

4. Simplify $\sqrt[4]{16a^4b^{20}}$.

a) $4a^2b^{10}$
b) $4a^2|b^5|$
c) $2b^{16}$
d) $2|a| \cdot |b^5|$

5. Which of the following is equivalent to $\frac{14}{3 - \sqrt{2}}$?

a) $\frac{42 - 14\sqrt{2}}{11}$
b) $6 + 2\sqrt{2}$
c) $6 - 2\sqrt{2}$
d) $4\sqrt{2}$

6. The graph of $y = \sqrt{x}$ has been translated to the right 1 unit and up 4 units. What is the equation of the translated graph?

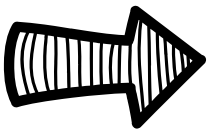
a) $y = 1 + \sqrt{x + 4}$
b) $y = 4 - \sqrt{x - 1}$
c) $y = 4 + \sqrt{x - 1}$
d) $y = 3 + \sqrt{x}$

7. Use the following drop-down menus: The function g has domain $x \geq 0$ and range $y \geq 3$. What are the domain and range of g^{-1}?

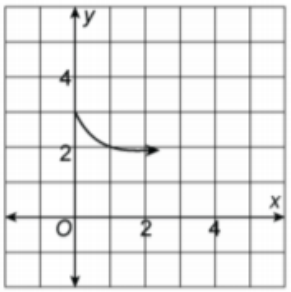
Domain: Choose... / $x \leq 3$ / $x \leq 0$ / $x \geq 3$ / $x \geq 0$

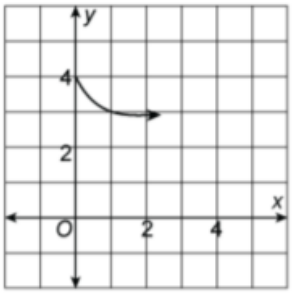
Range: Choose... / $y \leq 3$ / $y \leq 0$ / $y \geq 3$ / $y \geq 0$

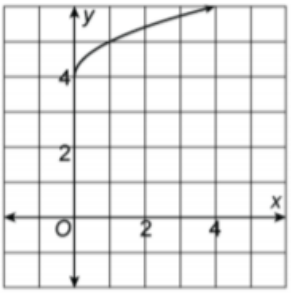
Go on to the next page.

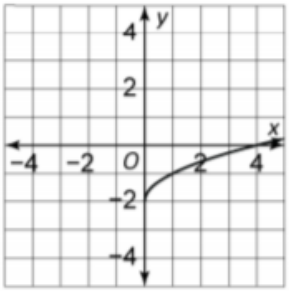


8. Which graph shows the function $f(x) = -2 + \sqrt{x}$?

a) 

b) 

c) 

d) 

9. Let $f(x) = \sqrt{x-2}$ and $g(x) = 3x$. What is the domain of $f \circ g$?

a) $x > \frac{3}{2}$ c) $x \geq \frac{2}{4}$

b) $x < \frac{1}{3}$ d) $x \geq \frac{2}{3}$

10. If $h(x) = 4x - 3$, what is an equation for $h^{-1}(x)$?

a) $h^{-1}(x) = 3x + 4$

b) $h^{-1}(x) = 3x - 4$

c) $h^{-1}(x) = \frac{x+3}{4}$

d) $h^{-1}(x) = \frac{x-3}{4}$

11. For the function $f(x) = \frac{1}{3} \cdot 6^x$, identify the y-intercept and asymptote. Use the drop-down menus to show your answer.

y-intercept:

Choose...
(0, –4)
(0, 1/3)
(0, 1)

asymptote:

Choose...
y = 0
y = –4

12. A warren of rabbits has a population of 350. The population is increasing at a rate of 3% per year. How can you write an exponential growth function to find the monthly growth rate?

a) $y = 350(0.9925)^t$ c) $y = 350(1.9925)^t$

b) $y = 350(1.0025)^{12t}$ d) $y = 350(0.9925)^{4t}$

13. Which function is the inverse of the exponential function $y = \left(\frac{3}{2}\right)^x$?

a) $y = \left(\frac{2}{3}\right)^x$ c) $y = \log_{\frac{3}{2}} x$

b) $y = (x)^{\frac{3}{2}}$ d) $y = \log_x \left(\frac{2}{3}\right)$

14. What is the solution to the equation $\log_2 (5x - 2) = -2$?
Write your solution as a decimal.

x = _____

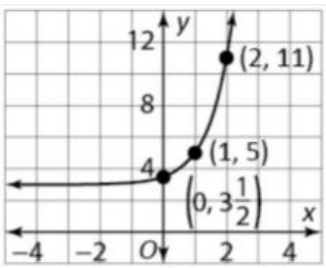
15. The graph shows the function $f(x) = \frac{1}{2} \cdot 4^x + 3$.
What is the value of the inverse function f^{-1} at $x = 5$?

a) 5

b) $3\frac{1}{2}$

c) 1

d) 2



16. What is the equation of the inverse function $f(x) = \log_5 (2x)$?

a) $y = \frac{1}{2} \cdot 5^x$ c) $y = \frac{1}{2} \cdot 4^x$

b) $y = \frac{1}{2} \cdot 6^x$ d) $y = \frac{1}{2} \cdot 3^x$

17. Which of the following is equivalent to the expression $\log \frac{m^2}{np^4}$?

a) $2\log m - \log n - 4\log p$
b) $\frac{\log m^2}{4\log np}$
c) $2\log m - \log n + 4\log p$
d) $8\frac{\log m}{\log np}$

18. **Part A.** What is the explicit formula for the geometric sequence 2, 6, 18, 54, ...?

a) $a_n = 2 \cdot (3)^{n-1}$
b) $a_n = 2 \cdot (3)^{n+1}$
c) $a_n = 2 \cdot (4)^{n-1}$
d) $a_n = 2 \cdot (4)^{n+1}$

18. **Part B.** what is the recursive formula for the geometric sequence 2, 6, 18, 54, ...?

a) $a_n = \begin{cases} 3, \text{ if } n = 1 \\ 3 \cdot a_{n-1}, \text{ if } n > 1 \end{cases}$
b) $a_n = \begin{cases} 2, \text{ if } n = 1 \\ 3 \cdot a_{n-1}, \text{ if } n > 1 \end{cases}$
c) $a_n = \begin{cases} 3, \text{ if } n = 0 \\ 3 \cdot a_{n-1}, \text{ if } n > 0 \end{cases}$
d) $a_n = \begin{cases} 2 \text{ if } n = 2 \\ 3 \cdot a_{n-1}, \text{ if } n > 2 \end{cases}$

18. **Part C.** What is the sum of the first 5 terms of the sequence?

a) 342
b) 642
c) 424
d) 242

19. What is the domain of the function $f(x) = \frac{x^2 - x - 2}{x^2 - 5x + 6}$?

a) $x \neq -2$ or 3
b) $x \neq -2$ or -3
c) $x \neq 2$ or -3
d) $x \neq 2$ or 3

20. Luke and Nora can peel 20 carrots in 6 minutes, working together. Luke can peel 5 carrots in 2 minutes, working alone. How many minutes would Nora take to peel 10 carrots, working alone?

a) 15
b) 12
c) 8
d) 4

21. What are the horizontal and vertical asymptotes of the graph of $y = \frac{5x+1}{2x-5}$?

a) $y = 2.5$; $x = 2.5$
b) $y = 2.5$; $x = -2.5$
c) $y = 0$; $x = 2.5$
d) $y = 0$; $x = -2.5$