Materials Allowed: Calculator (Graphing or Scientific), Scratch Paper

You can use a graphing calculator when you take the test. If you don’t have one, you may borrow one from me (I will also help you learn how to use it).

On the test, show your work for partial credit. Clearly label your work on scratch paper with the problem numbers.

The answers will be posted after everyone in the class has turned this review in (it will count as a graded homework assignment).

1. Multiply: \(-3(2b - 7b)^2\) [1]

2. Solve for \(x\): \(\frac{2x - 5}{4} = \frac{x}{3}\) [2]

3. Write \(\frac{9\frac{3}{16}}{16}\) as a percent. [3]


5. Simplify: Express the answer using positive exponents only.
\[
\frac{36x^{-7}y^3z^{11}}{12x^{-2}y^6z^{-4}}
\] [5]
6. Find the domain and range for the function graphed below.

7. Let \( f(x) = |x| - 4 \). Find \( f(-5) \).  

8. Use the graph of the function \( f(x) \) to find \( f^{-1}(-2) \).

9. Determine the value(s) of \( x \) for which the function is undefined: \( h(x) = \frac{9x}{x(x^2 - 36)} \).
10. Find the general form of the equation of the line that passes through the points \((-8, -1)\) and \((-3, 5)\).

\[ \text{[A]} \ 6x + 5y = -43 \quad \text{[B]} \ 5x + 6y = 43 \quad \text{[C]} \ 5x - 6y = -43 \quad \text{[D]} \ 6x - 5y = -43 \]

11. Graph: \(y = 2x + 2\)

12. Find the point of intersection of the two lines: \(x + 2y = 2\)
\(4x + 5y = -1\)

\[ \text{[A]} \ (4, 3) \quad \text{[B]} \ (3, -4) \quad \text{[C]} \ (4, -3) \quad \text{[D]} \ (-4, 3) \]

13. Solve: \(4x^2 + 5x = -1\)

\[ \text{[A]} \ -\frac{1}{4}, -1 \quad \text{[B]} \ -\frac{1}{4}, 1 \quad \text{[C]} \ \frac{1}{4}, -1 \quad \text{[D]} \ \frac{1}{4}, 1 \]
14. Graph the parabola: \( y = (x+1)^2 - 4 \)

15. Let \( f(x) = 1 - x^2 \), \( g(x) = 1 - x \). Find \( (f - g)(x) \).

16. If \( f(x) = x^3 \) and \( g(x) = -3 - 3x^2 \), find \( f(g(x)) \).

17. Solve: \( |4 - 0.25x| + 5 = 6 \)

18. Add: \( \frac{2}{x+9} + \frac{5}{x-9} \)

19. Janet can paint a kitchen in 4 hours and Charles can paint the same kitchen in 6 hours. How long would it take for both working together to paint the kitchen?

   [A] 10 hr         [B] 5 hr         [C] \( \frac{5}{12} \) hr         [D] \( \frac{2}{5} \) hr
20. Write an exponential function to model the situation. Then predict the value of the function after 5 years (to the nearest whole number). A population of 330 animals that decreases at an annual rate of 12%.

[A] \( f(x) = 330(0.88)^x \); 174
[B] \( f(x) = 330(0.88)^x \); 1452
[C] \( f(x) = 330(1.12)^x \); 1848
[D] \( f(x) = 330(1.12)^x \); 582

21. A tractor had a value of $10600 when it was purchased in 1992, and it was worth $5400 in 1998. If the tractor's value depreciated in a linear fashion, what was it worth in 2001?

22. The Forest Service introduces 50 wolves into a protected game preserve. The population of the pack is given by \( N = \frac{10(5+3t)}{1+0.04t} \), \( t \geq 0 \), where \( t \) is time given in years. Find the population of the wolf pack when \( t \) is 10 years.

23. A population of bacteria present in a culture after \( t \) minutes is given by the formula \( P = P_0e^{0.3558t} \), where \( P_0 \) is the initial number of bacteria and \( t \) is the time in hours.

If there are initially 50 bacteria in the culture, how long will it take the number of bacteria to triple (to the nearest tenth of an hour)?

24. Julio's neighborhood has a community garden. Julio knows the width of the garden is 20 ft and the area is 760 ft². How many feet of fencing will he need to enclose the garden?

25. A company that manufactures cast-iron chimeneas has daily production costs of \( C(x) = 600 - 10x + 0.5x^2 \), where \( C \) is the total cost in dollars and \( x \) is the number of units produced.

How many chimeneas should be produced each day to yield a minimum cost?