

Name: _____ Day/Time Class Meets: _____

Instructions:

- Use pencil only.
- Work problems completely and clearly in the space provided. Place your answer(s) on the line(s) provided.
- Use backs of sheets for additional writing space, if necessary.
- Credit (partial or full) will be given only if sufficient steps leading to the solution are shown. In most problems, no credit will be given for answers only.
- No books or notes may be used on the exam.
- This exam has a total of 5 pages (including the cover page). Check to make sure you have a complete exam.
- Erase or cross out work that you do not want graded.

1. Find the midpoint of the segment with endpoints $(8, -12)$ and $(6, 4)$

2. Solve the following:

(a) $4(x + 6) = 9x - 1$

(b) $4 = 2x(6x + 1)$

3. Write the following set in interval notation, and then graph the interval (write the interval on the line and draw the graph in the free space):

$$\{x \mid -4 \leq x < 0\}.$$

4. Perform the following operations, and if necessary, simplify:

(a) $(x + 3)(x^2 + 4x - 2)$

(b) $\frac{x^2 + 6x + 8}{2x - 6} \cdot \frac{6x - 18}{x^2 - 3x - 10}$

(c) $\frac{3}{y + 2} - \frac{y + 1}{y^2 - 4}$

5. Simplify

$$\frac{36x^4y^2}{9x^{-2}y}$$

6. Convert $\sqrt[3]{27xy^4z^6}$ to exponential form and simplify.

7. Find the distance between the points $(3, 2)$ and $(7, 5)$. Give an exact answer.

8. Rationalize the denominator of the rational expression

$$\frac{2}{\sqrt{y} + 3}$$

9. Factor $z^3 + 6z^2 - 3z - 18$.

10. Find the domain of the following:

(a) $f(x) = \frac{1}{x^2 + 6x + 5}$

(b) $f(x) = \sqrt{9x - 3}$.

11. Given that $h(x) = 4x^2 + 2x$, find the following and simplify:

(a) $g(4)$

(b) $g(y - 1)$

12. Find the equation of a circle centered at $(4, 2)$ and passing through the point $(7, -2)$.
