Sample Test Questions

Polynomials

1. Subtract the polynomials.

\(2x^2 - 6x - 4\) from \(-4x^2 + 6x + 10\)

2. Multiply.

\((4x - 1)(3x^2 - x + 6)\)

3. Factor completely.

\(ax - 2bx + ay - 2by\)

4. Factor completely.

\(y^3 + 64\)

5. Factor completely.

\(8x^2 + 6x - 9\)

6. Factor completely.

\(x^3 - 9x\)

Rational Expressions

7. Simplify.

\[
\frac{2x^2 - 7x - 4}{x^2 - 5x + 4}
\]

8. Multiply.

\[
\frac{4a + 36}{a^2 - 7a - 18} \cdot \frac{a^2 - a - 6}{a^2 - 81}
\]


\[
\frac{6a^2 b^2}{a^2 - 4} \div \frac{3ab^3}{a - 2}
\]

10. Subtract.

\[
\frac{5}{2x - 5} - \frac{3}{4x + 3}
\]

11. Simplify.

\[
\frac{3 + 2}{x - y} \quad \frac{5}{6}
\]
12. Solve.
\[
\frac{3}{n} + \frac{1}{6} = \frac{11}{3n}
\]

13. Solve.
\[
\frac{7}{x - 4} = \frac{x}{x^2 - 16} + \frac{1}{x + 4}
\]

14. Simplify. All variables represent positive real numbers.
\[
\sqrt[3]{75x^3y^4}
\]

15. Find the sum.
\[
4\sqrt{20x} + 5\sqrt{45x} - 10\sqrt{80x}
\]

\[
(2\sqrt[3]{6})(5\sqrt[4]{4})
\]

17. Multiply.
\[
(3\sqrt{2} + 2)(5\sqrt{2} - 3)
\]

18. Rationalize the denominator.
\[
\frac{\sqrt{7}}{\sqrt{12}}
\]

19. Solve and check.
\[
\sqrt{3x - 1} + 1 = 4
\]

20. Write the following using positive rational exponents.
\[
\frac{3}{2}y
\]

21. Solve.
\[
z^2 + 9 = 10z
\]

22. Solve.
\[
x^2 + 6x - 3 = 0
\]

23. Solve.
\[
3x^2 - 8x + 2 = 0
\]
Complex Numbers


\((−6 + 4i) + (8 − 7i)\)

25. Multiply.

\((−3 − 2i)(5 + 6i)\)

Absolute Value Equations

29. Solve.

\(|3x − 1| = 11\)

30. Solve.

\(|x + 3| = −4\)

Functions

26. Find the domain.

\(f(x) = \frac{−3x}{x + 4}\)

27. If \(f(x) = 2x^{2} − 5x − 7\), find \(f(−2)\).

Systems of Equations

28. Solve the system of equations.

\(4x − y = 9\)
\(2x + 3y = −27\)