1. Find all numbers for which the rational expression is undefined.

\[
\frac{z^2 + 6}{z^2 - z - 6}
\]

Answer: 3, -2

2. Simplify by removing factors of 1.

\[
\frac{q^2 - 1}{q^2 - 2q + 1}
\]

The simplified form is \[
\frac{q + 1}{q - 1}
\]

Answer: \[
\frac{q + 1}{q - 1}
\]

3. Multiply and simplify.

\[
\frac{a^2 + 6a - 27}{a^2 + 7a - 30} \cdot \frac{a^2 - 9a - 10}{a^2 + 10a + 9}
\]

The simplified product is \[
\frac{a - 10}{a + 10}
\]

Answer: \[
\frac{a - 10}{a + 10}
\]

4. Divide and simplify.

\[
\frac{5t^2 - 38t + 21}{5t^2 + 22t - 15} + \frac{35t^2 - 36t + 9}{7t^2 + 32t - 15}
\]

\[
\frac{5t^2 - 38t + 21}{5t^2 + 22t - 15} + \frac{35t^2 - 36t + 9}{7t^2 + 32t - 15} = \boxed{\text{ }}
\]

(Simplify your answer.)

Answer: \[
\frac{t - 7}{5t - 3}
\]
5. Divide and simplify.

\[
\frac{z^3 - 27}{z^3 + 27} \div \frac{z^2 - 9}{z^2 - 3z + 9}
\]

The simplified quotient is \(\boxed{\text{ }}\).

(Simplify your answer.)

Answer: \(\frac{z^2 + 3z + 9}{(z + 3)(z + 3)}\)

6. Perform the indicated operation. Simplify, if possible.

\[
\frac{t^2 + 2t}{t - 2} + \frac{4t - 16}{t - 2}
\]

The sum is \(\boxed{\text{ }}\).

Answer: \(t + 8\)

7. Add. Simplify by removing a factor of 1 when possible.

\[
\frac{6v - 9}{v^2 - 8v + 15} + \frac{6 - 5v}{v^2 - 8v + 15}
\]

\[
\frac{6v - 9}{v^2 - 8v + 15} + \frac{6 - 5v}{v^2 - 8v + 15} = \boxed{\text{ }}
\]

(Simplify your answer.)

Answer: \(\frac{1}{v - 5}\)

8. Add.

\[
\frac{2}{v + 6} + \frac{2}{3v}
\]

\[
\frac{2}{v + 6} + \frac{2}{3v} = \boxed{\text{ }}
\]

(Simplify your answer.)

Answer: \(\frac{8v + 12}{3v(v + 6)}\)
Perform the indicated operations and simplify.

\[
\frac{6v}{v^2 - 1} + \frac{2v}{1 - v} - \frac{7}{v - 1} = \boxed{\text{ }}
\]
(Simplify your answer.)

Answer: \[-2v^2 - 3v - 7 \over (v + 1)(v - 1)\]

10. Simplify the complex rational expression by the method of your choice.

\[
\frac{2}{x^3 y} + \frac{5}{xy^4} - \frac{5}{x^3 y} = \boxed{\text{ }}
\]
(Simplify your answer. Type your answer in factored form.)

Answer: \[\frac{2y^3 + 5x^2}{y^2(5 - 4x^2)}\]

11. Simplify.

\[
\frac{x - 2 + \frac{x}{5}}{x + 7 - \frac{7}{3x}} = \boxed{\text{ }}
\]

Answer: \[\frac{18x^2 - 30x}{15x^2 + 105x - 35}\]
12. Solve.

\[ \frac{x - 6}{x - 8} = \frac{2}{x - 8} \]

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

O A. The solution is \( x = \) . (Simplify your answer. Type an integer or a fraction.)

O B. There is no solution.

Answer: B

13. Solve.

\[ \frac{1}{c - 2} + \frac{2c}{c - 2} = \frac{12}{c^2 - 4c + 4} \]

Select the correct choice below and fill in any answer boxes present in your choice.

O A. The solution is \( c = \) .

(Type an integer or a fraction. Use a comma to separate answers as needed.)

O B. There is no solution.

Answer: A

14. Joe can cut and split a cord of firewood in 9 fewer hr(s) than Skyler can. When they work together, it takes them 6 hr(s). How long would it take each of them to do the job alone?

Answers 9

18

15. To determine the number of trout in a lake, a conservationist catches 172 trout, tags them and throws them back into the lake. Later, 42 trout are caught; 14 of them are tagged. How many trout are in the lake?

Answer: 516

There are trout in the lake.