1. Use \( U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\} \), \( A = \{1, 2, 4\} \), \( B = \{4, 6, 8, 9\} \), and \( C = \{3, 7, 10\} \) to find the given set.

\[ A \cup B \]

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

\( A \cup B = \{ \square \} \)

(Use a comma to separate answers as needed.)

\( B \). The solution is the empty set.

2. Evaluate the exponential expression.

\[ (-5)^3 \]

\[ (-5)^3 = \square \]

3. Evaluate the expression for \( p = -7 \) and \( r = -13 \).

\[ \frac{3p + 3(7 + p)^3}{r + 6} \]

The answer is \( \square \). (Type an integer or a simplified fraction.)

4. Divide.

\[ \frac{4x^3 - 6x^2 + 6}{x - 2} = \frac{4x^3 - 6x^2 + 6}{x - 2} = \square \]

(Simplify your answer.)

5. Factor the polynomial by grouping.

\[ p^2q^2 - 35 - 5q^2 + 7p^2 \]

\[ p^2q^2 - 35 - 5q^2 + 7p^2 = \square \]

6. Factor.

\[ 25w^2 + 19w + 4 \]

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

\( A \). \[ 25w^2 + 19w + 4 = \square \]

\( B \). The expression is prime.
7. Find the product or quotient.
\[
\frac{x^2 - 2x - 35}{x^2 - 4x - 45} \div \frac{x^2 + 7x + 10}{x^2 - 7x - 18}
\]

8. Perform the subtraction.
\[
\frac{2x}{x^2 + x - 20} - \frac{x}{x^2 - 25}
\]

9. Simplify the expression.
\[
\frac{3}{p^2 - 9} + p - \frac{1}{p - 3}
\]

10. Factor, using the common factor, \(4a^{-19/7}\). Assume all variables represent positive real numbers.
\[
-4a^{-5/7} + 8a^{-19/7}
\]

11. Rationalize the denominator.
\[
\frac{\sqrt{3} - 1}{4\sqrt{3} + 2\sqrt{2}}
\]
12. Solve the formula for the indicated variable.

\[ S = 4\pi rd + 4\pi r^2 \text{ for } d \]

13. Write the number as the product of a real number and \( i \).

\[ \sqrt{-150} \]


\[ (8 - 9i)^2 \]

15. Find all solutions by factoring.

\[ 2v^2 - 5v = 3 \]

16. Solve by completing the square.

\[ x^2 + 3x - 40 = 0 \]

17. Solve by completing the square.

\[ 2x^2 + 11x - 1 = 0 \]

18. Find two consecutive integers whose product is 210.
19. The sum of the squares of two consecutive integers is 421. Find the integers.

20. Solve the equation.

\[ \frac{6x}{x - 6} = 9 + \frac{7x^2}{x - 6} \]

21. Solve the equation.

\[ \sqrt{6x} = \sqrt{8x + 4} - 2 \]

22. Solve the equation.

\[ (2x + 4)^{1/3} - (5x - 1)^{1/3} = 0 \]
23. Solve.

\[ 6x^4 - 13x^2 + 5 = 0 \]

24. Solve the equation.

\[ 15(x + 2)^4 - 23(x + 2)^2 = -4 \]
1. A, 1, 2, 4, 6, 8, 9

2. -125

3. 3

4. \(4x^2 + 2x + 4 + \frac{14}{x - 2}\)

5. \((q^2 + 7)(p^2 - 5)\)

6. B

7. \(\frac{x - 7}{x + 5}\)

8. \(\frac{x^2 - 6x}{(x - 4)(x + 5)(x - 5)}\)

9. \(\frac{p^3 - 9p + 3}{p + 3}\)

10. \(4a^{-\frac{19}{7}}(-a^2 + 2)\)

11. \(\frac{6 - \sqrt{6} - 2\sqrt{3} + \sqrt{2}}{20}\)

12. \(\frac{S - 4\pi r^2}{4\pi r}\)

13. \(5i\sqrt{6}\)

14. \(-17 - 144i\)
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