1. Find the product.

\[(3x - 5z)(3x + 5z)\]

\[(3x - 5z)(3x + 5z) = \phantom{0}\]

2. Factor the trinomial completely. If the trinomial contains a greatest common factor (other than 1), factor out the GCF first.

\[x^2 - x - 72\]

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

- [ ] A. \(x^2 - x - 72 = \phantom{0}\) (Factor completely.)
- [ ] B. The polynomial is prime.

3. Solve the equation.

\[16x^2 - 25 = 0\]

\[x = \phantom{0}\]

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

4. Simplify the expression.

\[(2x)^0\]

\[(2x)^0 = \phantom{0}\]

5. Factor completely.

\[49x^2 - 28xy + 4y^2\]

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

- [ ] A. \(49x^2 - 28xy + 4y^2 = \phantom{0}\) (Factor completely.)
- [ ] B. The polynomial is prime.
6. Perform the division.

\[
\frac{17x^7 + 8x^4}{x} = \square \quad \text{(Simplify your answer.)}
\]

7. Factor the polynomial by grouping.

\[12x^2 - 25x + 12\]

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

○ A. \(12x^2 - 25x + 12 = \square\) (Factor completely.)

○ B. The polynomial is prime.

8. Factor the following sum of two cubes.

\[m^3 + 27n^3\]

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

○ A. \(m^3 + 27n^3 = \square\) (Factor completely. Simplify your answer.)

○ B. The polynomial is prime.

9. Factor the four-term polynomial by grouping.

\[8x^3 - 6x^2 + 12x - 9\]

\[8x^3 - 6x^2 + 12x - 9 = \square\] (Factor completely.)

10. Factor the trinomial completely.

\[a^2 - 13ab + 40b^2\]

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

○ A. \(a^2 - 13ab + 40b^2 = \square\) (Factor completely.)

○ B. The polynomial is prime.
11. Evaluate the expression using exponential rules. Write the result in standard notation.

\[(4 \times 10^{-3})(9 \times 10^{-5})\]

\[(4 \times 10^{-3})(9 \times 10^{-5}) = \boxed{}\]

12. Perform the indicated operation.

Subtract \((8x + 6)\) from \((5x^2 + 2x + 7)\).

\((8x + 6)\) subtracted from \((5x^2 + 2x + 7)\) is \boxed{}.


\((x + 12)^2\)

The answer is \boxed{}.

(Simplify your answer.)

14. Find the following product.

\[(9y - 3)^3\]

\((9y - 3)^3 = \boxed{}\)

15. Use the product rule to simplify the expression. Write the result using exponents.

\[(-3x^4y^4)(9xy^4)\]

\[(-3x^4y^4)(9xy^4) = \boxed{}\]

16. Find the quotient using long division.

\[
\frac{6x^2 + 21x + 6}{2x + 5}
\]

\[
\frac{6x^2 + 21x + 6}{2x + 5} = \boxed{}
\]
17. An object is thrown upward from the top of a 144-foot building with an initial velocity of 128 feet per second. The height $h$ of the object after $t$ seconds is given by the quadratic equation $h = -16t^2 + 128t + 144$. When will the object hit the ground?

The object will hit the ground at when the time is $\square$ seconds.

18. Simplify the following expression. Write the result using positive exponents only.

$$\frac{-25a^9b}{5ab^6}$$

$$\frac{-25a^9b}{5ab^6} = \square \text{ (Simplify your answer.)}$$

19. Find the dimensions of a rectangle whose width is 5 miles less than its length, and whose area is 104 square miles.

The length of the rectangle is $\square$ miles.

The width of the rectangle is $\square$ miles.

20. Multiply.

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

$$(x + 2)(x^3 - 4x + 3) = \square$$


$$(-5y^2 - 5y) + (8y^2 + y - 4)$$

$$(-5y^2 - 5y) + (8y^2 + y - 4) = \square \text{ (Do not factor.)}$$

22. Simplify the expression. Write the result using positive exponents only.

$$\left(\frac{a^{-4}b}{ab^3}\right)^{-4}$$

$$\left(\frac{a^{-4}b}{ab^3}\right)^{-4} = \square$$
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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1.</td>
<td>$9x^2 - 25z^2$</td>
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<tr>
<td>2.</td>
<td>A, $(x + 8)(x - 9)$</td>
</tr>
<tr>
<td>3.</td>
<td>$\frac{5}{4} - \frac{5}{4}$</td>
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<tr>
<td>4.</td>
<td>1</td>
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<tr>
<td>5.</td>
<td>A, $(7x - 2y)^2$</td>
</tr>
<tr>
<td>6.</td>
<td>$17x^6 + 8x^3$</td>
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<tr>
<td>7.</td>
<td>A, $(4x - 3)(3x - 4)$</td>
</tr>
<tr>
<td>8.</td>
<td>A, $(m + 3n)(m^2 - 3mn + 9n^2)$</td>
</tr>
<tr>
<td>9.</td>
<td>$(4x - 3)(2x^2 + 3)$</td>
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<tr>
<td>10.</td>
<td>A, $(a - 5b)(a - 8b)$</td>
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<td>11.</td>
<td>0.00000036</td>
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<tr>
<td>12.</td>
<td>$5x^2 - 6x + 1$</td>
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<tr>
<td>13.</td>
<td>$x^2 + 24x + 144$</td>
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<tr>
<td>14.</td>
<td>$729y^3 - 729y^2 + 243y - 27$</td>
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<td>15.</td>
<td>$-27x^5y^8$</td>
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<tr>
<td>16.</td>
<td>( \frac{3x + 3}{2x + 5} - \frac{9}{2x + 5} )</td>
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<tr>
<td>17.</td>
<td>9</td>
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<tr>
<td>18.</td>
<td>(- \frac{5a^8}{b^5})</td>
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<tr>
<td>19.</td>
<td>(\frac{13}{8})</td>
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<tr>
<td>20.</td>
<td>(x^4 + 2x^3 - 4x^2 - 5x + 6)</td>
</tr>
<tr>
<td>21.</td>
<td>(3y^2 - 4y - 4)</td>
</tr>
<tr>
<td>22.</td>
<td>(a^{20}b^8)</td>
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