1. Simplify the following expressions:

   (a) \( \frac{(x^2y)^2}{x^{-2}y^3} \)

   (b) \( x(x^2 - 2x + 6) - (x^3 - 5x^2 - 3) \)

2. Factor:

   (a) \( 9y^2 - 4x^2 \)

   (b) \( x^2 - 3x - 10 \)

3. Write down the quadratic formula and use it to solve the equation

\[ x^2 - 3x + 1 = 0 \]

for \( x \).
4. Let \( f(x) = \frac{1}{x} \). Compute

\[
\frac{f(2 + h) - f(2)}{h}
\]

and simplify as much as possible.

5. Fill in the table:

<table>
<thead>
<tr>
<th>( x )</th>
<th>0</th>
<th>( \frac{\pi}{6} )</th>
<th>( \frac{\pi}{4} )</th>
<th>( \frac{\pi}{3} )</th>
<th>( \frac{\pi}{2} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \sin x )</td>
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<td>( \cos x )</td>
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<tr>
<td>( \tan x )</td>
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</tr>
</tbody>
</table>

6. Let \( f(x) = 2x + 1 \) and \( g(x) = \frac{1}{x} \).

   (a) Compute \( f(g(x)) \)

   (b) Compute \( g(f(x)) \)