Factoring: 3-terms, a not equal to 1: \( ax^2 + bx + c \)

**YouTube Video**

\[ 6x^2 - 11x - 30 \]

Something new, so a little different

What two numbers when multiplied give you \( 6(-30) = \) ____

\[ 6x^2 - 11x - 30 \]

What same two numbers when added give you the middle number ____

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**Setting the problem up**

1) What two numbers when multiplied give you the number \(-180\)

2) What same two numbers when added you give you the middle number \(-11\)

Test numbers

___\cdot___  \hspace{1cm}  ___\cdot___

___\cdot___  \hspace{1cm}  ___\cdot___

___\cdot___  \hspace{1cm}  ___\cdot___

___\cdot___  \hspace{1cm}  ___\cdot___

___\cdot___  \hspace{1cm}  ___\cdot___

___\cdot___  \hspace{1cm}  ___\cdot___

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3) So we change \(-11x\) into the two factors

\[ 6x^2 - 11x - 30 \]

\[ 6x^2 - _____ + _____ - 30 \]

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4) The Box Method  \hspace{1cm}  or  \hspace{1cm}  Factor by Grouping
<table>
<thead>
<tr>
<th>$3x^2 - 8x + 5$</th>
<th>$2x^2 - 1x - 6$</th>
<th>$6x^2 + x - 15$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5x^2 - 7x - 6$</td>
<td>$35y^2 - 34y + 8$</td>
<td>$9x^4 + 18x^2 + 8$</td>
</tr>
<tr>
<td>$9x^2 + 15x + 4$</td>
<td>$4x^2 - 15x + 9$</td>
<td>$8x^2 + 8x - 6$</td>
</tr>
</tbody>
</table>

Hint: common factor