

1. $18x^2 - 15x - 12$

2. $m^2 - 3m - 108$

3. $196g^2 - 289p^6$

4. $k^2 + 16k + 64$

5. $4c^2 + 12cd - 27d^2$

6. $24y^5 - 150y^3$

Answers

1. $18x^2 - 15x - 12 = 3(2x+1)(3x-4)$
 $3(6x^2 - 5x - 4)$

Diagram for problem 1:
 $\begin{array}{r} -24 \\ -8 \times 3 \\ -5 \end{array}$
 $\begin{array}{r} 2x \\ +1 \end{array} \begin{array}{|c|c|} \hline 6x^2 & -8x \\ \hline +3x & -4 \\ \hline \end{array}$

2. $m^2 - 3m - 108 = (m-12)(m+9)$

Diagram for problem 2:
 $\begin{array}{r} -108 \\ -12 \times +9 \\ -3 \end{array}$

3. $196g^2 - 289p^6$

$= 14g \pm 17p^3$

4. $k^2 + 16k + 64$

$= (k+8)^2$
 $\begin{array}{r} 64 \\ 8 \times 8 \\ 16 \end{array}$

5. $4c^2 + 12cd - 27d^2$

Diagram for problem 5:
 $\begin{array}{r} -108 \\ +18 \times -6 \\ +12 \end{array}$
 $\begin{array}{r} 2c \\ +9 \end{array} \begin{array}{|c|c|} \hline 4c^2 & +12cd \\ \hline -6cd & -27d^2 \\ \hline \end{array}$
 $= (2c+9)(2c-3d)$

6. $24y^5 - 150y^3$

$= 6y^3(4y^2 - 25)$
 $= 6y^3(2y \pm 5)$