Factorizations Ex 7.9 Q6

**Answer :**

$a^2-14a-51$

$=a^2-14a+\left(\frac{14}{2}\right)^2-\left(\frac{14}{2}\right)^2-51 \quad \left[\textit{Adding and subtracting } \left(\frac{14}{2}\right)^2, \textit{ that is, } 7^2\right]$

$=a^2-14a+7^2-7^2-51$

$=\left(a-7\right)^2-100 \quad \left[\textit{Completing the square}\right]$

$=\left(a-7\right)^2-10^2$

$=\left[\left(a-7\right)-10\right]\left[\left(a-7\right)+10\right]$

$=\left(a-7-10\right)\left(a-7+10\right)$

$=\left(a-17\right)\left(a+3\right)$

Factorizations Ex 7.9 Q7

**Answer :**

$a^2+2a-3$

$=a^2+2a+\left(\frac{2}{2}\right)^2-\left(\frac{2}{2}\right)^2-3 \quad \left[\textit{Adding and subtracting } \left(\frac{2}{2}\right)^2, \textit{ that is, } 1^2\right]$

$=a^2+2a+1^2-1^2-3$

$=\left(a+1\right)^2-4 \quad \left[\textit{Completing the square}\right]$

$=\left(a+1\right)^2-2^2$

$=\left[\left(a+1\right)-2\right]\left[\left(a+1\right)+2\right]$

$=\left(a+1-2\right)\left(a+1+2\right)$

$=\left(a-1\right)\left(a+3\right)$

Factorizations Ex 7.9 Q8

**Answer :**

$$4x^2-12x+5$$
$$=4\left(x^2-3x+\tfrac{5}{4}\right) \qquad \left[Making\ the\ coefficient\ of\ x^2=1\right]$$
$$=4\left[x^2-3x+\left(\tfrac{3}{2}\right)^2-\left(\tfrac{3}{2}\right)^2+\tfrac{5}{4}\right] \qquad \left[Adding\ and\ subtracting\ \left(\tfrac{3}{2}\right)^2\right]$$
$$=4\left[\left(x-\tfrac{3}{2}\right)^2-\tfrac{9}{4}+\tfrac{5}{4}\right] \qquad \left[Completing\ the\ square\right]$$
$$=4\left[\left(x-\tfrac{3}{2}\right)^2-1^2\right]$$
$$=4\left[\left(x-\tfrac{3}{2}\right)-1\right]\left[\left(x-\tfrac{3}{2}\right)+1\right]$$
$$=4\left(x-\tfrac{3}{2}-1\right)\left(x-\tfrac{3}{2}+1\right)$$
$$=4\left(x-\tfrac{5}{2}\right)\left(x-\tfrac{1}{2}\right)$$
$$=\left(2x-5\right)\left(2x-1\right)$$

Factorizations Ex 7.9 Q9

**Answer :**

$$y^2-7y+12$$
$$=y^2-7y+\left(\tfrac{7}{2}\right)^2-\left(\tfrac{7}{2}\right)^2+12 \qquad \left[Adding\ and\ subtracting\ \left(\tfrac{7}{2}\right)^2\right]$$
$$=\left(y-\tfrac{7}{2}\right)^2-\tfrac{49}{4}+\tfrac{48}{4} \qquad \left[Completing\ the\ square\right]$$
$$=\left(y-\tfrac{7}{2}\right)^2-\tfrac{1}{4}$$
$$=\left(y-\tfrac{7}{2}\right)^2-\left(\tfrac{1}{2}\right)^2$$
$$=\left[\left(y-\tfrac{7}{2}\right)-\tfrac{1}{2}\right]\left[\left(y-\tfrac{7}{2}\right)+\tfrac{1}{2}\right]$$
$$=\left(y-\tfrac{7}{2}-\tfrac{1}{2}\right)\left(y-\tfrac{7}{2}+\tfrac{1}{2}\right)$$
$$=\left(y-4\right)\left(y-3\right)$$

Factorizations Ex 7.9 Q10

**Answer :**

$$z^2-4z-12$$
$$=z^2-4z+\left(\tfrac{4}{2}\right)^2-\left(\tfrac{4}{2}\right)^2-12 \qquad \left[Adding\ and\ subtracting\ \left(\tfrac{4}{2}\right)^2,\ that\ is,\ 2^2\right]$$
$$=z^2-4z+2^2-2^2-12$$
$$=\left(z-2\right)^2-16 \qquad \left[Completing\ the\ square\right]$$
$$=\left(z-2\right)^2-4^2$$
$$=\left[\left(z-2\right)-4\right]\left[\left(z-2\right)+4\right]$$
$$=\left(z-6\right)\left(z+2\right)$$

********** END **********