

6.1.113 Find the missing factor.

$$9x^{3n} + 21x^n = 3x^n \cdot ?$$

$$9x^{3n} + 21x^n = 3x^n \cdot (3x^{2n} + 7)$$

MXL gives you the GCF: $3x^n$.

Factor out GCF, show division:

$$= 3x^n \left(\frac{9x^{3n}}{3x^n} + \frac{21x^n}{3x^n} \right)$$

Reduce each fraction, subtract exponents:

$$= 3x^n (3x^{3n-n} + 7x^{n-n})$$

$$= 3x^n (3x^{2n} + 7 \cdot x^0)$$

$$x^0 = 1$$

$$= \boxed{3x^n (3x^{2n} + 7)}$$