Solutions

Award method and answer marks as indicated; accept equivalent correct methods.

2.1

- Add powers: x^7.

2.2

- Divide coefficients and subtract indices: $3a^4$.

2.3

- Square both factors: $4y^6$.

2.4

- $81 = 3^4$, so $n = 4$.

3.1

(a)

- $Q = (4 \times 3)x^{-2+5} = \mathbf{12x^3}$.

(b)

- $R = 12x^3/(6x) = \mathbf{2x^2}$.

(c)

- $R = 2(-2)^2 = 2(4) = \mathbf{8}$.

3.2

(a)

- Numerator is $9x^4$, so $E = x^{4-(-1)} = \mathbf{x^5}$.
- At $x = -2$, $E = (-2)^5 = \mathbf{-32}$.

(b)

- Rewrite $64 = 2^6$.
- Match exponents: $n + 1 = 6$, so $n = \mathbf{5}$.
- Both sides can be written with base 2.

3.3

- Raise the number and the power separately: $2^4 = 16$ and $(y^3)^4 = y^{12}$.
- $\mathbf{16y^{12}}$.

3.4

(a)

- Divide the numbers and subtract the indices: $15 \div 5 = 3$ and $7 - 3 = 4$.
- $\mathbf{3p^4}$.

(b)

- $\dfrac{1}{25} = 5^{-2}$, so $x = \mathbf{-2}$.