

Exercise 1G

1 Solve each of these equations for x .

a) $x^4 - 13x^2 + 36 = 0$

b) $x^4 - 2x^2 - 3 = 0$

c) $x^6 - 28x^3 + 27 = 0$

d) $x^6 + 5x^3 - 24 = 0$

e) $x - 5\sqrt{x} + 6 = 0$

f) $x - 6\sqrt{x} + 5 = 0$

g) $x^4 + x^2 = 12$

h) $x = 4\sqrt{x} - 3$

i) $x^8 + 16 = 17x^4$

j) $x^6 = 8 + 2x^3$

k) $8\sqrt{x} = 15 + x$

l) $65x^4 = 16 + 4x^8$

2 Solve each of these equations for x .

a) $x^2 + 1 = \frac{6}{x^2}$

b) $x^3 + 7 = \frac{8}{x^3}$

c) $x = 12\sqrt{x} - 35$

d) $x^3 - 6x + \frac{8}{x} = 0$

e) $\sqrt{x} + \frac{10}{\sqrt{x}} = 7$

f) $x^2 + 3 = \frac{18}{x^2}$

g) $x^4(x^4 - 20) + 64 = 0$

h) $15 = \sqrt{x}(8 - \sqrt{x})$

i) $\frac{5}{x^2} = x^2 + \frac{4}{x^6}$

j) $2(x^4 + 6) = 11x^2$

k) $2 + \frac{10}{x} = \frac{9}{\sqrt{x}}$

l) $x = \frac{2(3x^3 + 8)}{x^5}$

3 Solve $(x + 3)^2 - 5(x + 3) + 4 = 0$.

4 Solve $(3x - 1)^2 + 6(3x - 1) - 7 = 0$.

5 a) Solve $y^2 - 7y + 10 = 0$.

b) Hence find the solutions to $(x^2 + 1)^2 - 7(x^2 + 1) + 10 = 0$.

6 a) Solve $y^2 - 5y - 14 = 0$.

b) Hence find the solutions to $(x^3 - 1)^2 - 5(x^3 - 1) - 14 = 0$.

7 Solve $x(x + 1) + \frac{24}{x(x + 1)} = 14$.

*8 a) By using the substitution $p = x + \frac{1}{x}$, show that the equation

$$2x^4 + x^3 - 6x^2 + x + 2 = 0$$

reduces to $2p^2 + p - 10 = 0$.

b) Hence solve $2x^4 + x^3 - 6x^2 + x + 2 = 0$.
