Solve for x.

1 proportion

$$\dfrac{3}{x^2+4x} = \dfrac{1}{x+4}$$

$$x^2 + 4x = 3x + 12$$
$$x^2 + x - 12 = 0$$
$$(x+4)(x-3) = 0$$
$$x = \cancel{-4}, 3$$

2

$$\left[\dfrac{1}{x} + \dfrac{4}{x+1} = 6\right] x(x+1)$$

$$x + 1 + 4x = 6x(x+1)$$
$$0 = 6x^2 + x - 1$$
$$0 = (3x-1)(2x+1)$$
$$x = \dfrac{1}{3}, \ -\dfrac{1}{2}$$

3

$$\left[\dfrac{3x-2}{x-2} = \dfrac{6}{x^2-4} + 1\right](x+2)(x-2)$$
$$(x+2)(x-2)$$

$$(3x-2)(x+2) = 6 + (x^2-4)$$
$$3x^2 + 4x - 4 = x^2 + 2$$
$$2x^2 + 4x - 6 = 0 \qquad x = -3, 1$$
$$x^2 + 2x - 3 = 0$$
$$(x+3)(x-1) = 0$$