

$$3) \quad 3^{(2x+3)} = 3^{x^2}$$

$$2x+3 = x^2$$

$$0 = x^2 - 2x - 3$$

$$(x-3)(x+1)$$

$$[x=3, x=-1]$$

$$7) \quad 4^{x-3} = 8^{(4-x)}$$

$$(2^2)^{x-3} = (2^3)^{(4-x)}$$

$$(2)^{2x-6} = (2)^{12-3x}$$

$$2x-6 = 12-3x$$

$$2x+3x = 12+6$$

$$5x = 18$$

$$\boxed{x = \frac{18}{5}}$$

$$6) \quad \frac{1}{2}^{(6-x)} = 2$$

$$[(2)^{(-1)}]^{6-x} = 2$$

$$2^{x-6} = 2$$

$$x-6 = 1$$

$$x = 1+6$$

$$\boxed{x = 7}$$

$$9) \quad a) \quad f(x) = a^x$$

$$c) \quad f(x) = 3a^x$$

$$e) \quad f(x) = a^x + 3$$