

**1.**

[9 points]

Solve the following equations:

(a)  $2 \times 9^x + 1 = 55$

(b)  $\frac{16}{2^{x+2}} = 4 \times 8^x$

(c)  $9 \times 27^x = \frac{\sqrt{3}}{3^x}$

(d)  $\frac{3^{x^2-2}}{9} = 27^x$

**2.**

[3 points]

Solve the following equation by using the substitution  $t = 2^x$ :

$$2^{2x+1} - 9 \times 2^x + 4 = 0$$