Solve the following and leave the answer as an exact value

1.
$$3^x = 25$$

$$2. \quad 10^{x-4} = 7^x$$

3.
$$4^{2x} = 15^{x-1}$$

4.
$$9^{2x+3} = 568$$

5.
$$2^{-x} = 6$$

6.
$$8^{-\frac{x}{3}} = 20$$

7.
$$2^{x+3} = 17^x$$

8.
$$17^{x+4} = 196^{3x-2}$$

9.
$$4^{x+1} = 5^{x-2}$$

10.
$$3(2^x) = 6^{x-2}$$