

$$1. 3^9 \cdot 3^3 = 3^{9+3} = 3^{12}$$

$$2. 3^x \cdot 3^{4x} = 3^{x+4x} = 3^{5x}$$

$$3. \frac{7^{13}}{7^6} = 7^{13-6} = 7^7$$

$$4. \frac{8^x}{8^{x-6}} = 8^{x-(x-6)} = 8^6$$

$$5. 2^x \cdot 2^{6-x} = 2^{x+6-x} = 2^6$$

$$6. \frac{7^x}{7^3} = 7^{x-3}$$

$$7. \frac{5^{3x}}{5^x \cdot 5^6} = \frac{5^{3x}}{5^{x+6}} = 5^{3x-(x+6)} = 5^{2x-6}$$

$$8. \frac{12^{13}}{12^3} = 12^{13-3} = 12^{10}$$

$$9. 4^{3x} \cdot 4^{13-3x} = 4^{3x+13-3x} = 4^{13}$$

$$10. \frac{13^{2x} \cdot 13^6}{13^x \cdot 13^3} = \frac{13^{2x+6}}{13^{x+3}} = 13^{2x+6-(x+3)} = 13^{x+3}$$