

6.3 Notes Day 3

Solving Equations with a common base

$$b^x = b^y \quad \text{then} \quad x = y$$

$$\textcircled{1} \quad 2^{3x} = 32$$

$$2^{3x} = 2^5$$

$$3x = 5$$

$$x = 5/3$$

1) Rewrite both sides
w/ same base

2) Once bases are the
same, set exponents eq.

$$\textcircled{2} \quad 25^{3x} = 125^{x+2}$$

$$(5^2)^{3x} = (5^3)^{x+2}$$

$$5^{6x} = 5^{3x+6}$$

$$6x = 3x + 6$$

$$3x = 6$$

$$x = 2$$

$$\textcircled{3} \quad \left(\frac{1}{9}\right)^x = 81^{x+4}$$

$$9^{-1x} = (9^2)^{x+4}$$

$$9^{-1x} = 9^{2x+8}$$

$$-x = 2x + 8$$

$$-3x = 8$$

$$x = -\frac{8}{3}$$

$$\textcircled{4} \quad \left(\frac{4}{9}\right)^{x-3} = \left(\frac{27}{8}\right)^4$$

$$\left(\left(\frac{2}{3}\right)^2\right)^{x-3} = \left(\frac{2}{3}\right)^{-12}$$

$$\left(\frac{2}{3}\right)^{2x-6} = \left(\frac{2}{3}\right)^{-12}$$

$$2x - 6 = -12$$

$$2x = -6$$

$$\boxed{x = -3}$$