

$$37. \left(\frac{25}{81}\right)^{2x+1} = \left(\frac{729}{125}\right)^{-3x+1}$$

$$\left(\frac{5^2}{9^2}\right)^{2x+1} = \left(\frac{9^3}{5^3}\right)^{-3x+1}$$

$$\left(\frac{5^2}{9^2}\right)^{2x+1} = \left(\frac{5^{-3}}{9^{-3}}\right)^{-3x+1}$$

$$\left(\left(\frac{5}{9}\right)^2\right)^{2x+1} = \left(\left(\frac{5}{9}\right)^{-3}\right)^{-3x+1}$$

(37)

$$(35) \left(\frac{1}{2^3}\right)^{3x+4} = \left(\frac{1}{2^2}\right)^{-2x+4}$$

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

$$-9x-12 = 8x-8$$

$$4x+2 = 9x-3$$

Algebra 2 7.2

Solve exponential equations

Solve exponential inequalities

Calculate compound interest

exponential increase (rate of increase)

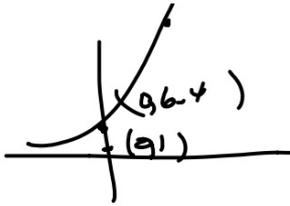
exponential decrease (rate of decrease)

compound interest

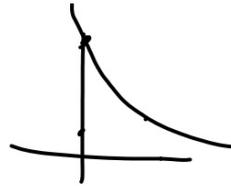
$$(b)^{\circ} = (b)^{\circ} \rightarrow b > 1$$

whiteboards

Quiz Tues. 7.1-7.2



$$y = 6.4(2.5)^x$$



Write an exponential function for the graph that passes through the given points.

16. ~~(0, 6.4)~~ and (3, 100)

$$y = a(b)^x$$

$$y = 6.4(b)^x$$

$$\frac{100}{6.4} = \frac{6.4}{6.4}(b)^3$$

17. (0, 256) and (4, 81)

$$15.625 = b^3$$

$$2.5 = b$$

$$y = 25b(b)^x$$

$$81 = 25b(b)^4$$

$$0.3164 = b$$

$$0.75 = b$$

$$y = 25b\left(\frac{3}{4}\right)^x$$

- Anything to the zero power =?
- Sketch (increasing or decreasing?)
- What does the y-int tell us?
- Ordered pair?
- Write the equation

Exponential functions are used in situations involving compound interest.

**Compound interest** is interest paid on the principal of an investment and any previously earned interest.

semi ann 2  
quarterly 4  
daily 365  
Weekly 52  
monthly 12

### Key Concept Compound Interest

You can calculate compound interest using the following formula.

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

where  $A$  is the amount in the account after  $t$  years,  $P$  is the principal amount invested,  $r$  is the annual interest rate, and  $n$  is the number of compounding periods each year.

Convert % to decimal form!  
Careful:  $t$  must be in YEARS  
Equation will be given for test

**2 Solve Exponential Inequalities** An exponential inequality is an inequality involving exponential functions.  $\geq \leq$

 **Key Concept** Property of Inequality for Exponential Functions

**Words** Let  $b > 1$ . Then  $b^x > b^y$  if and only if  $x > y$ , and  $b^x < b^y$  if and only if  $x < y$ .

**Example** If  $2^x > 2^6$ , then  $x > 6$ . If  $x > 6$ , then  $2^x > 2^6$ .

This property also holds true for  $\leq$  and  $\geq$ .

For bases  $> 1$  (bec. they get bigger when you multiply...)

Solve each inequality.

7.  $4^{2x+6} \leq 64^{2x-4}$

$$4^{2x+6} \quad (4^3)^{2x-4}$$

$$\begin{array}{r} 2x+6 \leq 6x-12 \\ -6x-6 \quad -6x-6 \\ \hline -4x \leq -18 \quad x \geq 4.5 \\ \frac{-4x}{-4} \leq \frac{-18}{-4} \end{array}$$

Write on same base (Alg 1)  
Keep bases > 1

$$\begin{array}{r} 2x+6 \leq 6x-12 \\ -2x+12 \quad -2x+12 \\ \hline 18 \leq 4x \\ \frac{18}{4} \leq \frac{4x}{4} \\ 4.5 \leq x \end{array}$$

$$8. 25^{y-3} \leq \left(\frac{1}{125}\right)^{y+2} \quad \frac{1}{5^3}$$

$$(5^2)^{y-3} \leq (5^{-3})^{y+2}$$

$$\begin{array}{r} 2y-6 \leq -3y-6 \\ +3y+6 \quad +3y+6 \\ \hline \end{array}$$

$$5y \leq 0$$

$$y \leq 0$$

Find a way to write with base >1  
Same base for both

$$27. \left(\frac{1}{27}\right)^{2d-2} \leq 81^{d+4}$$

$$(3^{-3})^{2d-2} \leq (3^4)^{d+4}$$

29.  $\left(\frac{1}{36}\right)^{w+2} < \left(\frac{1}{216}\right)^{4w}$

$$(6^{-2})^{w+2} < (6^{-3})^{4w}$$

Re-write with  $b > 1$

8.  $25^{y-3} \leq \left(\frac{1}{125}\right)^{y+2}$

WB 7.2

odd + 14, 16, 18

ET  $\frac{3, 4}{1, 3}$