

# Math 1030 #8b

## The Power of Compounding Continuous Interest, APY

Continuous Compounding means they are compounding an infinite number of times per year. Here is the formula.

$$A = P \cdot e^{(APR \cdot Y)} \text{ often seen as } A = Pe^{rt}$$

### EX 1:

Find the balance after 1, 5, and 20 years if you invest \$500 in an account with 2.7% APR compounded continuously.

### Some questions:

- How does the APR affect the balance?
- How does the amount of time affect the balance?
- How does the number of compounding times per year affect it?

Annual Percentage Yield (APY) is the actual percentage by which the balance increases in one year (the relative increase in 1 year).

- If compounded annually,  $APY = APR$ .
- If compounded more than once per year,  $APY > APR$ .
- The APY does not depend on the starting principal.
- APY is also called effective yield or the yield.

**EX 2:**

Find the annual percentage yield to the nearest hundredth of a percent if a bank offers an APR of 2.25% compounded quarterly.

**EX 3:**

How much must you deposit today so that you have \$180,000 (for a college fund) in 11 years? Assume no additional deposits will be made in an account which pays an APR of 6% and compounds monthly.