13.4 Notes part 1

The compound interest formula
The equation $V = P(1+r)^t$ is used when compounded anually

- V: value after t years
- P: initial principal
- r: Interest Rate as decimal
- t: years

1.) Kyle invests $2000 and earns 3.12% anually.

a) Find the value in 10 years

$V = 2000(1+.0312)^{10}$

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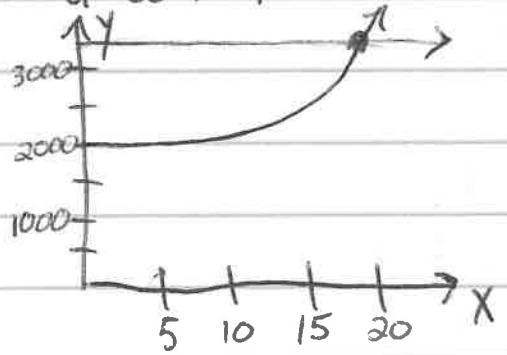
$V \approx \$2,719.31$

b) Find when the value reaches $3400



$t \approx 17.3$ years

Jennifer invests $3000 at 1.9%

c) How much longer will it take Kyle's investment to reach $3400, compared to Jennifer.

Y_1 $V = 3000(1+0.019)^x$

Y_2 3400 $x \approx 6.65$ years

$17.3 - 6.65 = 10.65$ years

d) When will they have the same value?

$t \approx 34.1$ years

$V \approx \$5,696.45$

$$V = P\left(1 + \frac{r}{n}\right)^{n \cdot t}$$

is used when the investment is compounded (n) times per year.

2) A person invests $500 at 7.9% interest for 20 years.

a) Find the value if it is compounded monthly

12 times per year $(n = 12)$

$$V = 500\left(1 + \frac{0.079}{12}\right)^{(12)(20)}$$

$\approx \$2,414.94$

annually → $n = 1$

semi-anually → $n = 2$

quarterly → $n = 4$

monthly → $n = 12$

weekly → $n = 52$

daily → $n = 365$