6% compounded quarterly
for 8 yrs,
$$P = 1008$$
 $FV = P(1+i)^n$
 $N = 5yrs \times 4 \text{ pariod} / yr = 20$
 $i = 6/20 = \frac{0.6}{4} = 0.016$
 $FV = /00 (1+0.015)$

#6. $P = /0008$ A) $P = /0508$
 $i = 0.05$
 $N = 5$
 $FV = /050(1.05)^5$
 $= 1276.28^4$
B) $i \rightarrow 0.06$

C) $N \Rightarrow 5 \times 12$
 $i \Rightarrow 0.05$
 $= 1283.36$
D) $N \rightarrow 6$
 $= 1341.10$

#6. $FV = 17500$
 $t = 10$
 $N = /0 \times 2$
 $t = 6.6\% = .056 = .028$
 $PV = \frac{FV}{(1+i)^n}$
 $= 17500$
 $\frac{17500}{(1.028)^{20}}$
 $= 10673.39$

1.5 Investments involving regular payments

When a regular payment is made to an investment, we call that an annuity. Since this can be complicated to calculate, we'll use the TVM-solver on your calculators. It is important to know how it works.

calculators. It is important to know how it works.

$$N = \#$$
 of compound

 $PV = \text{present value}$
 $PV = \text{present value}$

EXAMPLE 1 Determining the future value of an investment involving regular deposits

Darva is saving for a trip to Australia in 5 years. She plans to work on a student visa while she is there, so she needs only enough money for a return flight and her expenses until she finds a job. She deposits \$500 into her savings account at the end of each 6-month period from what she earns as a server. The account earns 3.8%, compounded semi-annually. How much money will be in the account at the end of 5 years? How much of this money will be earned interest?



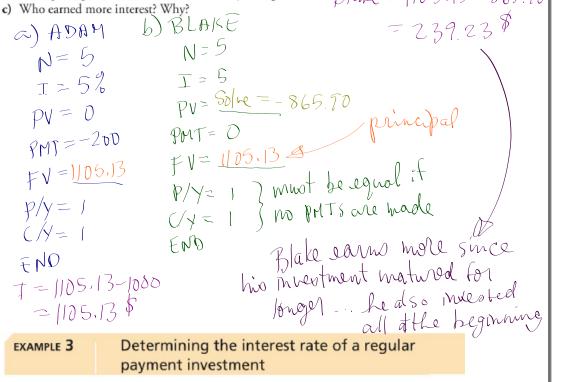
$$N = 5 \times 2 = 10$$
 $T_0 = 3.8$
 $T_0 = 3.8$

EXAMPLE 2 Comparing a regular payment investment with a single payment investment

Adam made a \$200 payment at the end of each year into an investment that earned 5%, compounded annually. Blake made a single investment at 5%, compounded annually. At the end of 5 years, their future values were c) ADAM: I = 105.13 equal.

- a) What was their future value?
- b) What principal amount did Blake invest 5 years ago?

Blake: 1/05.13-865.20



payment investment

Jeremiah deposits \$750 into an investment account at the end of every 3 months. Interest is compounded quarterly, the term is 3 years, and the future value is \$10 059.07. What annual rate of interest does Jeremiah's investment earn?

$$N = 4 \times 3 = 12$$
 $I = 8.00\%$
 $PV = 0$
 $PMT = -750$
 $FV = 10059.07$
 $P/y = 4$
 $C/y = 4$
 EPD

Determining the regular payment amount of an investment

Celia wants to have \$300 000 in 20 years so that she can retire. Celia has found a trust account that earns a fixed rate of 10.8%, compounded annually.

- a) What regular payments must Celia make at the end of each year to meet her goal of \$300 000?
- b) How much interest will she earn over the 20 years?

a)
$$N = 20$$
 $T = 10.8$
 $PV = 0$
 $PMT = -4781.10$
 $T = 300000 - 75622$
 $FV = 300000$
 $P/Y = 1$
 $C/Y = 1$
 END

Determining the term of a regular payment investment

On Luis's 20th birthday, he started making regular \$1000 payments into an investment account at the end of every 6 months. He wants to save for a down payment on a home. His investment earns 3.5%, compounded semi-annually. At what age will he have more than \$18 000?

$$N = 15.78...$$
 $T = 3.5$
 $PV = 0$
 $PMT = -1000$
 $FV = 18000$
 $P/Y = 2$
 $C/Y = 2$
 FND

Since Linis heads 16

periods to grow his

needs 27

Linis will be 28.

Homefun: pg. 55 #5, 7, 8, 9, 10, 13, 17