Time Value of Money

29/29

Ronan Walker

$$FV = a \times \frac{r^N - 1}{r - 1}$$

where N is # compounding periods
r = interest rate = 1 + P
P = interest per period
a = size of each payment
for start of month $a = PMT \times r$
" end " $a = PMT$

Question 1:

$400 at end of month $a = \$400$

$P = \frac{4.5\%}{12} = .045/12 = 0.00375$

$\boxed{r = 1.00375}$

$N = 12 \times 3 = 36$

$$FV = 400 \times \frac{1.00375^{36} - 1}{0.00375} = \boxed{\$15386.43}$$

5/5

She will have $15386.43 to use as a deposit.
$15386.43 \times 5 = 76932.18$
She can afford a 20% down payment on a $76932.18 home.

She might be able to buy a large tent.

HA. HA.
I GUESS THIS PROBLEM IS OUT OF DATE.

Question 2

Current Value $1172.59

$n = 15$

$p = 0.07$

$$1172.59 = P(1+0.07)^{15}$$

$$P = \frac{1172.59}{1.07^{15}} = \$425$$

5/5

This guy put away $425 : 15 years ago.

Question 3

Loan of $160 000

30 years compounded monthly $n = 360$ months

$p = 5.75\%/12 = 0.00479$

$$PMT = PV \times \frac{P}{[1-(1+P)^{-N}]}$$

a) $$PMT = 160000 \times \frac{0.00479}{[1-[1.00479)^{-360}]} = \$933.51$$

5/5

b) (PMT × N) − 160000 = Amount of interest

They pay $176 064.79 in interest, more than the amount they initially borrowed.

∴

Somewhere, a banker is laughing until he wets his pants.

Question 4

$PMT = \$950$

$n = 20 \times 12 = 240$

$P = \frac{0.055}{12} = 0.004583$

$$PMT = PV \times \frac{P}{[1-[1+P]^{-N}]}$$

$$PV = PMT \times \frac{[1-[1+P]^{-N}]}{P}$$

$$= 950 \times \frac{[1-(1.004583)^{-240}]}{0.004583} = \$138108.55$$

5/5

So including the down payment, The house sold for

$$\boxed{\$163108.55}$$