

Money Time Machine

Find what money is worth now and later.

HIGH SCHOOL • MA.912.FL.3.3

MA.912.FL.3.3 "Solve real-world problems involving present value and future value of money"

NAME _____

DATE _____

MONEY GROWS OVER TIME

For annual compounding, future value is $FV = P(1+r)^t$, where P is the starting amount, r is the decimal rate, and t is the number of years. To find present value, reverse the growth: $PV = FV / (1+r)^t$.

WORKED EXAMPLE

Find the future value of \$200 invested at 5% annual interest for 2 years.

1. Write the values: $P=200$, $r=0.05$, $t=2$.
2. $FV = 200(1+0.05)^2$
3. $FV = 200(1.1025)$
4. $FV = 220.50$

Answer: \$220.50

PRACTICE 6 problems

- 1** Find the future value of \$80 invested at 25% annual interest for 1 year.

ANSWER _____

- 2** Find the future value of \$150 invested at 10% annual interest for 3 years.

ANSWER _____

- 3** How much money must you invest today to have \$288 after 1 year at 20% annual interest?

ANSWER _____

- 4** Find the present value of \$1,331 due in 3 years if the annual interest rate is 10%.

ANSWER _____

- 5** Find the future value of \$400 invested at 15% annual interest for 1 year.

ANSWER _____

- 6** How much money must you invest today to have \$1,080 after 1 year at 20% annual interest?

ANSWER _____

APPLY IT Show your work

- 1** You plan to buy a used scooter in 3 years. It will cost \$864. A savings account earns 20% interest compounded annually. How much must you deposit today?

WORK SPACE

ANSWER _____

- 2** Maya deposits \$600 from a summer job in an account that earns 15% interest compounded annually. How much will she have after 1 year? If a laptop is expected to cost \$675 then, how much money will she have left after buying it?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

At the start of year 1, Eli can deposit \$600 now in an account earning 10% annual interest for 4 years. Or, he can wait 1 year and deposit \$660 at the same rate for the remaining 3 years. At the end of 4 years, which option gives him more money? Show or explain your reasoning.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Find the future value of \$80 invested at 25% annual interest for 1 year.	\$100
2	Find the future value of \$150 invested at 10% annual interest for 3 years.	\$199.65
3	How much money must you invest today to have \$288 after 1 year at 20% annual interest?	\$240
4	Find the present value of \$1,331 due in 3 years if the annual interest rate is 10%.	\$1,000
5	Find the future value of \$400 invested at 15% annual interest for 1 year.	\$460
6	How much money must you invest today to have \$1,080 after 1 year at 20% annual interest?	\$900

PART 2 • APPLY IT

1. **\$500** Use $PV = FV / (1 + r)^t$. $PV = 864 / (1.20)^3 = 864 / 1.728 = 500$.
2. **\$690 in the account; \$15 left after buying the laptop** Find the future value: $600(1.15) = 690$. Then subtract the laptop cost: $690 - 675 = 15$.

CHALLENGE

Neither option gives more. Both equal \$878.46 because $600(1.10)^4 = \$878.46$ and $660(1.10)^3 = \$878.46$.

Accept equivalent money notation, such as \$100.00 for \$100. For the challenge, students must identify that both options have the same future value and may explain that \$660 is \$600 after one year of 10% growth.