Class 6 Show work, do not submit (so you can study)  **Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. Match the problems to the graphs and appropriate formulas

Graphical user interface

Description automatically generated with medium confidence

1. Can you use the annuity formula?

T=1

T=1

T=1

T=1

T=2

T=2

T=5

T=3

T=3

T=6

T=3

T=4

T=2

T=3

T=4

$100

$200

$300

$100

$100

$100

$100

$100

$100

$300

$100

$100

$100

$100

$100

1. True example from my co-op! With changed numbers.  
   You work for a large widget manufacturer. The manufacturer has a large customer, who just went bankrupt and cannot pay their debt of $950,000. As part of their restructuring effort, they offer you several options to choose from, and recuperate some of the money they owe you.  
   Which option is best? Assume that your discount rate is 11% - your customer is a risky business.

Option 1:

They pay $500,000 now, $50,000 next year, and $25,000 in two years.

Option 2:

They pay $55,000 every year for 10 years, starting right now

Option 3:

They pay $30,000 in three years, and that amount grows at a constant rate of 10%, for 12 years.

Option 4: This one is difficult. At least find the PV of one share, but also try to challenge yourself.

You can become part-owner of their firm, owning 10% of outstanding shares. In this case, you will have the rights to all future dividends, assuming a successful restructuring (Chapter 11 Bankruptcy). There is a 60% chance this happens. The firm has 3 million shares outstanding. Each share would get paid a $0.5 dividend starting in 5 years. You anticipate a growth rate of 0.1%, but you would get paid forever.

1. Look at the statement below.   
   a) Explain what the decision to get paid right now vs. making $50 every month depends on.

b) Assume you get paid $50 every month forever. What interest rate would make you indifferent?

c) If your interest rate is 0.1% per month, which option would you choose?

d) Assuming your interest rate is 0.1% per month, what would your passive income need to be to be indifferent between the two options?

Graphical user interface, text, application

Description automatically generated

1. Scrooge McDuck, Donald Duck, and Minnie Mouse are all planning for retirement. They just graduated high school and will retire in 50 years. Who will have the most?

Scrooge knows he will inherit a lot of money: $1 million. He decides to never work again in his life, and instead invest the $1 million in a passive mutual fund in 10 years, returning 5.3% on average per year. He pays for his expenses by working as a motivational speaker about the importance of hard work.

Donald Duck works as a mason and bartender. He is able to save $20,000 every year for 40 years, earning a 6% return. After that, he does not add any more money to his savings, but he keeps what he has invested for 10 more years in a safer portfolio with a return of 4%.

Minnie Mouse was a straight A-student. She decided to go to College and then Medical School. Although she was able to pay off her loans from her income, this also means that she was not able to save until 15 years after high school. She then starts investing $40,000 every year for 35 years, at a rate of 6%.

1. Compare the results from Q5. Is there anything that surprises you? Anything that stands out?