What is Present Value?

Worksheet

Present value is the current worth of a future amount of money, discounted back at a required rate of return: PV = FV / (1 + r)^n, where r is the discount rate and n is the number of periods.

PV = @frac{FV}{(1 + r)^n}

Questions

1. What is the present value of $1,000 received in 1 year at a 10% discount rate?

A) $1,100
B) $909.09
C) $900.00
D) $1,000.00

2. In the PV formula PV = FV/(1+r)^n, what does r represent?

A) Number of periods
B) Future value
C) Discount (interest) rate
D) Present value

3. As the discount rate increases, present value

A) increases
B) stays the same
C) decreases
D) becomes negative

4. Why is $1,000 today worth more than $1,000 in 5 years?

A) Inflation never matters
B) Money today can be invested to earn a return
C) Future money is illegal to use
D) There is no difference

5. What is the present value of $10,000 to be received in 10 years, at a discount rate of 5%?

6. Find the present value of $5,000 due in 5 years at an 8% discount rate.

7. A bond pays $20,000 in 20 years. At a 3% discount rate, what is it worth today?

8. Define: What does present value (PV) measure?

9. Define: What is the present value formula?

10. Define: What happens to PV as the discount rate rises?

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Answer Key

1. B) $909.09 - PV = 1,000 / 1.10 = $909.09.
2. C) Discount (interest) rate - r is the discount rate applied each period.
3. C) decreases - A higher rate discounts future cash more, lowering PV.
4. B) Money today can be invested to earn a return - Money today has earning potential - the core idea behind time value of money.
5. PV = FV / (1+r)^n PV = 10,000 / (1.05)^10 PV = 10,000 / 1.62889 PV $6,139.13
6. PV = 5,000 / (1.08)^5 PV = 5,000 / 1.46933 PV $3,402.92
7. PV = 20,000 / (1.03)^20 PV = 20,000 / 1.80611 PV $11,074.68
8. How much a future sum of money is worth today, after discounting for time and risk.
9. PV = FV / (1 + r)^n
10. PV falls - a higher rate discounts future money more heavily.

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