COMPOUND INTEREST & TIME VALUE OF MONEY

Name: [ ]   Class: [ ]

Mr. Bahnsen argues that investing early can make a difference of hundreds of thousands of dollars. We will test that argument by looking at two hypothetical investors. Each will invest $50,000, but Mr. A will begin investing early, taking advantage of compound interest, while Ms. B will wait until later when she feels more financially secure.

Mr. A

Mr. A begins investing $2500/year at age 22, when he gets his first real job. He invests for 20 years; then he stops.
We will assume a 7% average annual return. Calculate the earnings by multiplying the new balance each year by 1.07.
*New balance is previous year's account plus new investment
**Principal + Interest is found by multiplying the new balance by 1.07

Mr. A - Invests $50,000 total, starting age 22, stops at age 41

Age	Investment	New Balance	P+I
22	$2,500.00	$2,500.00	$2,675.00
23	$2,500.00	$5,175.00	$5,537.25
24	$2,500.00		
25	$2,500.00		
26	$2,500.00		
27	$2,500.00		
28	$2,500.00		
29	$2,500.00		
30	$2,500.00		
31	$2,500.00		

32	$2,500.00		
33	$2,500.00		
34	$2,500.00		
35	$2,500.00		
36	$2,500.00		
37	$2,500.00		
38	$2,500.00		
39	$2,500.00		
40	$2,500.00		
41	$2,500.00		
42	$0		
43	$0		
44	$0		
45	$0		
46	$0		
47	$0		
48	$0		
49	$0		
50	$0		
51	$0		
52	$0		
53	$0		
54	$0		
55	$0		

56	$0		
57	$0		
58	$0		
59	$0		
60	$0		
61	$0		
62	$0		
63	$0		
64	$0		
65	$0		

Total Investment $_____

How much does Mr. A invest in total? (This is the principal.)

_____

How many years does he invest? _____

Where does all the other money come from? _____

How much money has his investment earned over the years?

 _____

How much does Mr. A have at age 65, even though he stopped investing money at

age 41? _____

In this next example, Mr. A begins investing at age 22 and continues to invest $2,500 a year, each year, until he turns 65.

Mr. A - Invests $2,500 annually from age 22 - 65

Age	Investment	New Balance	P+I
22	$2,500.00	$2,500.00	$2,675.00
23	$2,500.00	$5,175.00	$5,537.00
24	$2,500.00		
25	$2,500.00		
26	$2,500.00		
27	$2,500.00		
28	$2,500.00		
29	$2,500.00		
30	$2,500.00		
31	$2,500.00		
32	$2,500.00		
33	$2,500.00		
34	$2,500.00		
35	$2,500.00		
36	$2,500.00		
37	$2,500.00		

38	$2,500.00		
39	$2,500.00		
40	$2,500.00		
41	$2,500.00		
42	$2,500.00		
43	$2,500.00		
44	$2,500.00		
45	$2,500.00		
46	$2,500.00		
47	$2,500.00		
48	$2,500.00		
49	$2,500.00		
50	$2,500.00		
51	$2,500.00		
52	$2,500.00		
53	$2,500.00		
54	$2,500.00		
55	$2,500.00		
56	$2,500.00		
57	$2,500.00		
58	$2,500.00		
59	$2,500.00		
60	$2,500.00		
61	$2,500.00		

62	$2,500.00		
63	$2,500.00		
64	$2,500.00		
65	$2,500.00		

Total Investment $_____

In this example, Mr. A continues to invest $2,500 every year, beginning at age 22 until he turns 65. Rate of return remains the same, 7% each year.

How much is his principal investment? _____

How many years does he invest? _____

How much has his money earned over these years? _____

How much more money does Mr. A. have at 65 in this example than he does in the first example, where he only invests from age 22-41? _____

Mrs. B

Ms. B thinks she can't afford to invest when she's just beginning her career; therefore, she waits until she's more established. When she turns 40, though, she realizes that it's time. Now making more money, she is able to invest $5000/year, which she does for 10 years.
She, like Mr. B, invests a total of $50,000, earning a 7% annual rate of return.

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Ms. B - Invests $50,000 total, starting age 40, stops at age 49

Age	Investment	New Balance	P+I
40	$5,000.00	$5,00.00	$5,350.00
41	$5,000.00		
42	$5,000.00		
43	$5,000.00		
44	$5,000.00		
45	$5,000.00		
46	$5,000.00		
47	$5,000.00		
48	$5,000.00		
49	$5,000.00		
50	$0		
51	$0		
52	$0		
53	$0		
54	$0		
55	$0		
56	$0		
57	$0		
58	$0		
59	$0		
60	$0		

61	$0		
62	$0		
63	$0		
64	$0		
65	$0		

Total Investment $50,000.00

How many years does she invest? _____

How much does Ms. B's money earn above her principal? _____

Who has more money from their $50,000 investment, Mr. A or Ms. B? _____

Why? _____

_____

In this next example, Ms. B continues to invest $5,000 a year, from age 40 – 65.

Ms. B - Invests $5,000 annually from age 40-65

Age	Investment	New Balance	P+I
40	$5,000.00	$5,000.00	$5,350.00
41	$5,000.00		
42	$5,000.00		
43	$5,000.00		
44	$5,000.00		

45	$5,000.00		
46	$5,000.00		
47	$5,000.00		
48	$5,000.00		
49	$5,000.00		
50	$5,000.00		
51	$5,000.00		
52	$5,000.00		
53	$5,000.00		
54	$5,000.00		
55	$5,000.00		
56	$5,000.00		
57	$5,000.00		
58	$5,000.00		
59	$5,000.00		
60	$5,000.00		
61	$5,000.00		
62	$5,000.00		
63	$5,000.00		
64	$5,000.00		
65	$5,000.00		

Total Investment _____

How much does her money make over these years? _____

How much more money did Ms. B invest in this example than she did when she stopped investing at age 49? _____

How much more money does Ms. B have at age 65 in this example than she did when she stopped investing at age 49? _____

How much of that additional money is principal? _____

How much of that additional money is interest? _____

So is her additional money more principal or interest? _____

Why? _____

_____

In this next example, Ms. B postpones savings for an additional 10 years, and doesn't begin saving until she turns 50. She invests $5,000 per year, from age 50 – 65.

Ms. B - Invests $5,000 annually from age 50-65

Age	Investment	New Balance	P+I
50	$5,000.00	$5,000.00	$5,350.00
51	$5,000.00		
52	$5,000.00		
53	$5,000.00		
54	$5,000.00		
55	$5,000.00		
56	$5,000.00		

57	$5,000.00		
58	$5,000.00		
59	$5,000.00		
60	$5,000.00		
61	$5,000.00		
62	$5,000.00		
63	$5,000.00		
64	$5,000.00		
65	$5,000.00		

Total Investment _____

How much money does Ms. B end up with at age 65 in this example? _____

How much interest has her money earned over these years? _____

How much less money does she have in this example than in her first investing example? _____

How much less money does she have in this example than in her second investing example? _____

What is working against Ms. B? _____

Which plan would you recommend to Ms. B? _____

Based on these examples, what have you learned about saving for retirement? (or savings in general.) What would you recommend to yourself, your friends, or your family?

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