



Algebra II: Investments Project

Honors Algebra II (Period 2)



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The value of Tesla sportscar for after 10 years, 20 years, and 50 years.



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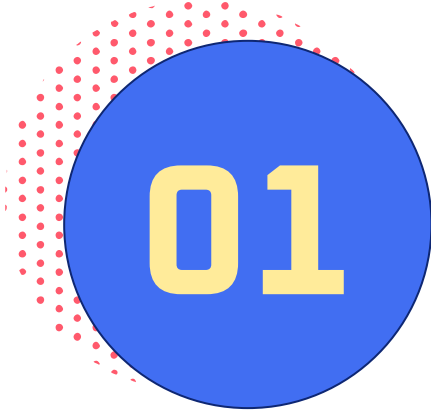
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The compare and contrast scenario of investments including a graph.





Purchases/ Investments



List of purchases I made.



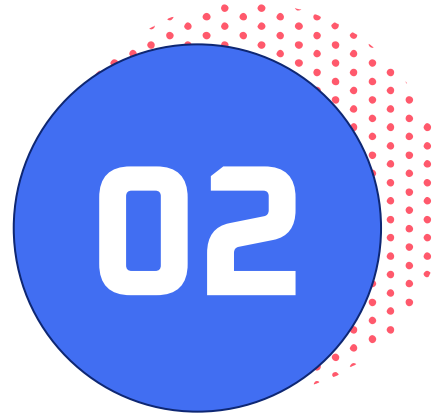


	Item	Cost
Purchase 1	Kandinsky painting 	\$450,000
Purchase 2	Tesla Sportscar 	\$65,000
Purchase 3	Investment in Index Funds Stocks earn 3% annual interest compounded continuously	\$485,000

Total: 1 million dollars

Expected value of Kandinsky Painting

The value of Kandinsky painting (art)
for after 10 years, 20 years, and 50
years.





	Initial Cost	10 years	20 years	50 years
Kandinsky Painting	\$450,000	\$971,516.249	\$2,097,430.715	\$21,105,725.631



1. Kandinsky : cost: 450000 Increase in value 8%

$$f(t) = 450000(1 + 0.08)^t$$

$$f(t) = 450000(1.08)^t$$

$$t = 10 \quad f(10) = 450000(1.08)^{10} = 971516.249$$

$$t = 20 \quad f(20) = 450000(1.08)^{20} = 2097430.715$$

$$t = 50 \quad f(50) = 450000(1.08)^{50} = 21105725.631$$



03

Expected value of Tesla Sportscar

The value of Tesla sportscar for after
10 years, 20 years, and 50 years.





	Initial Cost	10 years	20 years	50 years
Tesla Sportscar	\$65,000	\$31,458.850	\$15,225.527	\$1726.079



2. Tesla : cost: 65000 Decreases by 7%

$$f(t) = 65000(1 - 0.07)^t$$

$$f(t) = 65000(0.93)^t$$

$$t = 10 \quad f(10) = 65000(0.93)^{10} = 31458.850$$

$$t = 20 \quad f(20) = 65000(0.93)^{20} = 15225.527$$

$$t = 50 \quad f(50) = 65000(0.93)^{50} = 1726.079$$

Expected Value of Investing in Index Funds

✦ The value of investing in index funds for after 10 years, 20 years, and 50 years.

04



	Initial Cost	10 years	20 years	50 years
Investing in Index Funds	\$485,000	\$654,681.522	\$883,727.618	\$2,173,619.199



3. Invest in Index Funds : Amount: 485000 Compounded continuously
3% annual interest

$$V(t) = 485000e^{0.03t}$$

$$t = 10 \quad V(10) = (485000)e^{(0.03)10} = (485000)e^{0.3} = 654681.522$$

$$t = 20 \quad V(20) = (485000)e^{(0.03)20} = (485000)e^{0.6} = 883727.618$$

$$t = 50 \quad V(50) = (485000)e^{(0.03)50} = (485000)e^{1.5} = 2173619.199$$



05

Explanation of the choices

Explanation of the whether my purchase choices were good or not.



Were my purchase choices good or not?



Kandinsky Painting



Purchasing the Kandinsky painting is a good choice. It is because the value of the painting increase by 8% annually, which is the most amount of profit produced from the items in the list. Since its initial cost is also high, it will make me gain a lot of money compared to products that have lower initial cost. Also, since this painting has its own unique identity, it is a highly valuable art piece. Therefore, this is a good choice.

Tesla Sportscar



Purchasing the Tesla Sportscar is a bad choice. It is because the value of the Tesla sportscar decreases by 7% annually, which is a very big decrease. However, I chose this product instead of others because the amount of money it loses is less than that of other products that have lower percentage of decrease in their values. Despite the decrease of price, this might be good if I needed a car. However, I definitely believe that I don't need a sportscar. Therefore, this is a bad choice.



Investment in Index Funds



Investing in the index funds is a good choice. It is because the investment provides a 3% annual interest compounded continuously. This is the best investment compared to other investments since it has the largest interest rate and is compounded continuously. In the long-term, investing in funds is also good for my life since it would make myself be prepared for any future situations.





Compare/Contrast Scenario

✦ The compare and contrast scenario of investments including a graph.



06

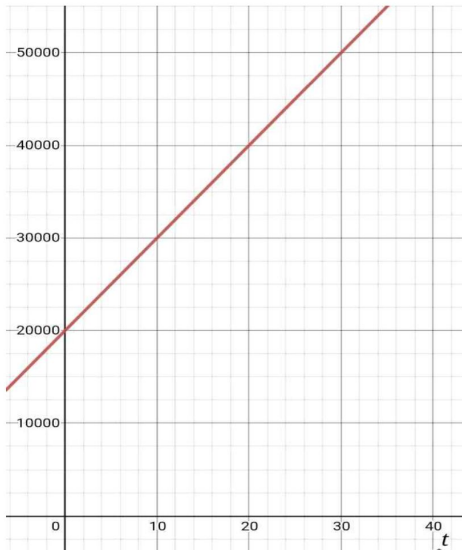


Compare/Contrast Scenario



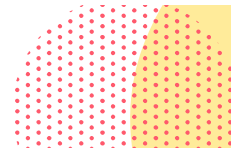
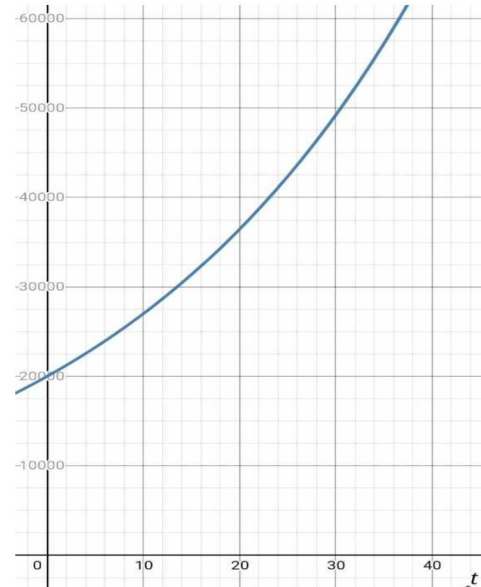
1) 5% simple interest : $V(t) = 20000(1 + 0.05t)$ Linear function

t (years)	10	20	30	40	50
V(t)(\$)	30000	40000	50000	60000	70000



2) 3% annual interest compounded continuously: $V(t) = 20000e^{0.03t}$

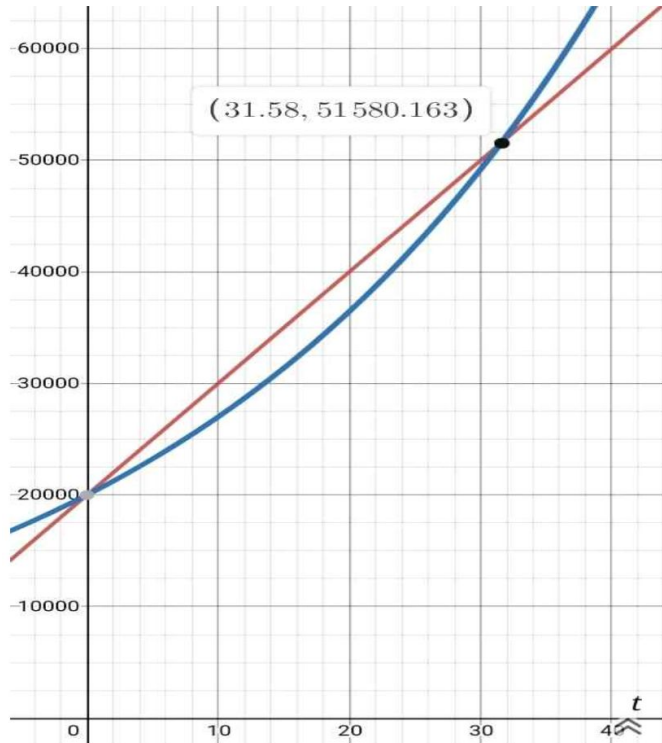
t (years)	10	20	30	40	50
V(t)(\$)	26997.176	36442.376	49192.062	66402.338	89633.781



Compare/Contrast Scenario



<Two graphs on the previous slide combined>



Investment option: Invest in Index Funds Initial investment: \$20,000

The comparison that I made is the **index fund investment** with the 3% of annual interest rate compounded continuously and the **simple interest account** with the interest rate of 5%. Initially, **\$20,000** were invested in each account. According to the graph on the left, the profit of the simple interest rate account is higher at the first. However, from **31.58 years** after the investment, the index fund profit exceeds the 5% simple interest profit since the index fund graph increases **exponentially** while the simple interest graph increase **linearly**. Therefore, if I am going to invest longer than 31.58 years, I should invest in index funds, but if I am going to invest shorter than that, I should invest on the 5% simple interest account to maximize my profit through the investment.



Thank You!

