

Making the Minimum (1/2)

Directions

Zach, a college freshman, recently received his first credit card, which he signed up for during orientation. The credit card has a 19% annual percentage rate (APR) and it has a minimum payment of only \$10 or 2.5% of the balance (whichever is larger). Zach promised himself that he would use the credit card only for emergencies. It's now the middle of December and Zach has to stop working for a couple weeks in order to finish some semester projects, study for and take his finals, and then go home for the holiday break. Since he won't get a paycheck again until January, he had to use his credit card for the following "emergencies":

| | |
|--|--------------|
| Gas for the drive back home | \$55 |
| Food (snacks for studying) | \$45 |
| Christmas gifts for family | \$225 |
| Books for next semester's classes | \$585 |
| | \$910 |

Many people in debt only make the minimum monthly payments on their credit cards. So, what will happen if Zach only makes the minimum payments on this one credit card? Assuming he charges nothing else and makes every minimum payment on time (two BIG assumptions), it will take him 154 months to pay for these "emergencies." Use the chart (Minimum Payment Schedule) on the following pages as you answer the questions below.

- ① What is the first minimum payment Zach would pay—\$10 or the 2.5%? How much would the 2.5% be?
- ② How many years/months of payments will Zach have to make?
- ③ At what month does the amount of the monthly payment applied to principal start to increase?
- ④ What percentage of Zach's first year of total payments is just interest?
- ⑤ How long will it take before the principal portion of Zach's payment is greater than the interest portion of his payment?
- ⑥ What is the outstanding balance at month 91 when the \$10 minimum monthly payment kicks in? How long would someone typically think it would take to pay off that balance at \$10 per month? How long will it actually take when the interest is added each month?
- ⑦ The 19% APR is the annual rate but it is compounded monthly. What is the monthly interest rate?
- ⑧ How could Zach have avoided using a credit card even with the large expenses and time off from work?

Making the Minimum (2/2)

Minimum Payment Schedule

| Month | Minimum Payment | Interest Paid | Principal Paid | Balance | Month | Minimum Payment | Interest Paid | Principal Paid | Balance | Month | Minimum Payment | Interest Paid | Principal Paid | Balance |
|-------|-----------------|---------------|----------------|----------|-------|-----------------|---------------|----------------|----------|-------|-----------------|---------------|----------------|----------|
| 1 | \$22.75 | \$14.41 | \$8.34 | \$901.66 | 31 | \$17.26 | \$10.93 | \$6.33 | \$684.00 | 61 | \$13.09 | \$8.29 | \$4.80 | \$518.88 |
| 2 | \$22.54 | \$14.28 | \$8.27 | \$893.39 | 32 | \$17.10 | \$10.83 | \$6.27 | \$677.73 | 62 | \$12.97 | \$8.22 | \$4.76 | \$514.13 |
| 3 | \$22.33 | \$14.15 | \$8.19 | \$885.20 | 33 | \$16.94 | \$10.73 | \$6.21 | \$671.52 | 63 | \$12.85 | \$8.14 | \$4.71 | \$509.41 |
| 4 | \$22.13 | \$14.02 | \$8.11 | \$877.09 | 34 | \$16.79 | \$10.63 | \$6.16 | \$665.36 | 64 | \$12.74 | \$8.07 | \$4.67 | \$504.74 |
| 5 | \$21.93 | \$13.89 | \$8.04 | \$869.05 | 35 | \$16.63 | \$10.53 | \$6.10 | \$659.26 | 65 | \$12.62 | \$7.99 | \$4.63 | \$500.12 |
| 6 | \$21.73 | \$13.76 | \$7.97 | \$861.08 | 36 | \$16.48 | \$10.44 | \$6.04 | \$653.22 | 66 | \$12.50 | \$7.92 | \$4.58 | \$495.53 |
| 7 | \$21.53 | \$13.63 | \$7.89 | \$853.19 | 37 | \$16.33 | \$10.34 | \$5.99 | \$647.23 | 67 | \$12.39 | \$7.85 | \$4.54 | \$490.99 |
| 8 | \$21.33 | \$13.51 | \$7.82 | \$845.37 | 38 | \$16.18 | \$10.25 | \$5.93 | \$641.30 | 68 | \$12.27 | \$7.77 | \$4.50 | \$486.49 |
| 9 | \$21.13 | \$13.38 | \$7.75 | \$837.62 | 39 | \$16.03 | \$10.15 | \$5.88 | \$635.42 | 69 | \$12.16 | \$7.70 | \$4.46 | \$482.03 |
| 10 | \$20.94 | \$13.26 | \$7.68 | \$829.94 | 40 | \$15.89 | \$10.06 | \$5.82 | \$629.59 | 70 | \$12.05 | \$7.63 | \$4.42 | \$477.61 |
| 11 | \$20.75 | \$13.14 | \$7.61 | \$822.33 | 41 | \$15.74 | \$9.97 | \$5.77 | \$623.82 | 71 | \$11.94 | \$7.56 | \$4.38 | \$473.23 |
| 12 | \$20.56 | \$13.02 | \$7.54 | \$814.79 | 42 | \$15.60 | \$9.88 | \$5.72 | \$618.10 | 72 | \$11.83 | \$7.49 | \$4.34 | \$468.89 |
| 13 | \$20.37 | \$12.90 | \$7.47 | \$807.32 | 43 | \$15.45 | \$9.79 | \$5.67 | \$612.44 | 73 | \$11.72 | \$7.42 | \$4.30 | \$464.60 |
| 14 | \$20.18 | \$12.78 | \$7.40 | \$799.92 | 44 | \$15.31 | \$9.70 | \$5.61 | \$606.82 | 74 | \$11.61 | \$7.36 | \$4.26 | \$460.34 |
| 15 | \$20.00 | \$12.67 | \$7.33 | \$792.59 | 45 | \$15.17 | \$9.61 | \$5.56 | \$601.26 | 75 | \$11.51 | \$7.29 | \$4.22 | \$456.12 |
| 16 | \$19.81 | \$12.55 | \$7.27 | \$785.32 | 46 | \$15.03 | \$9.52 | \$5.51 | \$595.75 | 76 | \$11.40 | \$7.22 | \$4.18 | \$451.94 |
| 17 | \$19.63 | \$12.43 | \$7.20 | \$778.12 | 47 | \$14.89 | \$9.43 | \$5.46 | \$590.29 | 77 | \$11.30 | \$7.16 | \$4.14 | \$447.79 |
| 18 | \$19.45 | \$12.32 | \$7.13 | \$770.99 | 48 | \$14.76 | \$9.35 | \$5.41 | \$584.88 | 78 | \$11.19 | \$7.09 | \$4.10 | \$443.69 |
| 19 | \$19.27 | \$12.21 | \$7.07 | \$763.92 | 49 | \$14.62 | \$9.26 | \$5.36 | \$579.51 | 79 | \$11.09 | \$7.02 | \$4.07 | \$439.62 |
| 20 | \$19.10 | \$12.10 | \$7.00 | \$756.92 | 50 | \$14.49 | \$9.18 | \$5.31 | \$574.20 | 80 | \$10.99 | \$6.96 | \$4.03 | \$435.59 |
| 21 | \$18.92 | \$11.98 | \$6.94 | \$749.98 | 51 | \$14.36 | \$9.09 | \$5.26 | \$568.94 | 81 | \$10.89 | \$6.90 | \$3.99 | \$431.60 |
| 22 | \$18.75 | \$11.87 | \$6.88 | \$743.11 | 52 | \$14.22 | \$9.01 | \$5.22 | \$563.72 | 82 | \$10.79 | \$6.83 | \$3.96 | \$427.64 |
| 23 | \$18.58 | \$11.77 | \$6.81 | \$736.30 | 53 | \$14.09 | \$8.93 | \$5.17 | \$558.55 | 83 | \$10.69 | \$6.77 | \$3.92 | \$423.72 |
| 24 | \$18.41 | \$11.66 | \$6.75 | \$729.55 | 54 | \$13.96 | \$8.84 | \$5.12 | \$553.43 | 84 | \$10.59 | \$6.71 | \$3.88 | \$419.84 |
| 25 | \$18.24 | \$11.55 | \$6.69 | \$722.86 | 55 | \$13.84 | \$8.76 | \$5.07 | \$548.36 | 85 | \$10.50 | \$6.65 | \$3.85 | \$415.99 |
| 26 | \$18.07 | \$11.45 | \$6.63 | \$716.23 | 56 | \$13.71 | \$8.68 | \$5.03 | \$543.33 | 86 | \$10.40 | \$6.59 | \$3.81 | \$412.17 |
| 27 | \$17.91 | \$11.34 | \$6.57 | \$709.67 | 57 | \$13.58 | \$8.60 | \$4.98 | \$538.35 | 87 | \$10.30 | \$6.53 | \$3.78 | \$408.40 |
| 28 | \$17.74 | \$11.24 | \$6.51 | \$703.16 | 58 | \$13.46 | \$8.52 | \$4.94 | \$533.42 | 88 | \$10.21 | \$6.47 | \$3.74 | \$404.65 |
| 29 | \$17.58 | \$11.13 | \$6.45 | \$696.71 | 59 | \$13.34 | \$8.45 | \$4.89 | \$528.53 | 89 | \$10.12 | \$6.41 | \$3.71 | \$400.94 |
| 30 | \$17.42 | \$11.03 | \$6.39 | \$690.33 | 60 | \$13.21 | \$8.37 | \$4.85 | \$523.68 | 90 | \$10.02 | \$6.35 | \$3.68 | \$397.27 |

| Month | Minimum Payment | Interest Paid | Principal Paid | Balance | Month | Minimum Payment | Interest Paid | Principal Paid | Balance |
|-------|-----------------|---------------|----------------|----------|-------|-----------------|---------------|----------------|----------|
| 91 | \$10.00 | \$6.29 | \$3.71 | \$393.56 | 123 | \$10.00 | \$3.87 | \$6.13 | \$238.08 |
| 92 | \$10.00 | \$6.23 | \$3.77 | \$389.79 | 124 | \$10.00 | \$3.77 | \$6.23 | \$231.85 |
| 93 | \$10.00 | \$6.17 | \$3.83 | \$385.96 | 125 | \$10.00 | \$3.67 | \$6.33 | \$225.52 |
| 94 | \$10.00 | \$6.11 | \$3.89 | \$382.07 | 126 | \$10.00 | \$3.57 | \$6.43 | \$219.09 |
| 95 | \$10.00 | \$6.05 | \$3.95 | \$378.12 | 127 | \$10.00 | \$3.47 | \$6.53 | \$212.56 |
| 96 | \$10.00 | \$5.99 | \$4.01 | \$374.11 | 128 | \$10.00 | \$3.37 | \$6.63 | \$205.93 |
| 97 | \$10.00 | \$5.92 | \$4.08 | \$370.03 | 129 | \$10.00 | \$3.26 | \$6.74 | \$199.19 |
| 98 | \$10.00 | \$5.86 | \$4.14 | \$365.89 | 130 | \$10.00 | \$3.15 | \$6.85 | \$192.34 |
| 99 | \$10.00 | \$5.79 | \$4.21 | \$361.68 | 131 | \$10.00 | \$3.05 | \$6.95 | \$185.39 |
| 100 | \$10.00 | \$5.73 | \$4.27 | \$357.41 | 132 | \$10.00 | \$2.94 | \$7.06 | \$178.32 |
| 101 | \$10.00 | \$5.66 | \$4.34 | \$353.07 | 133 | \$10.00 | \$2.82 | \$7.18 | \$171.15 |
| 102 | \$10.00 | \$5.59 | \$4.41 | \$348.66 | 134 | \$10.00 | \$2.71 | \$7.29 | \$163.86 |
| 103 | \$10.00 | \$5.52 | \$4.48 | \$344.18 | 135 | \$10.00 | \$2.59 | \$7.41 | \$156.45 |
| 104 | \$10.00 | \$5.45 | \$4.55 | \$339.63 | 136 | \$10.00 | \$2.48 | \$7.52 | \$148.93 |
| 105 | \$10.00 | \$5.38 | \$4.62 | \$335.00 | 137 | \$10.00 | \$2.36 | \$7.64 | \$141.29 |
| 106 | \$10.00 | \$5.30 | \$4.70 | \$330.31 | 138 | \$10.00 | \$2.24 | \$7.76 | \$133.52 |
| 107 | \$10.00 | \$5.23 | \$4.77 | \$325.54 | 139 | \$10.00 | \$2.11 | \$7.89 | \$125.64 |
| 108 | \$10.00 | \$5.15 | \$4.85 | \$320.69 | 140 | \$10.00 | \$1.99 | \$8.01 | \$117.63 |
| 109 | \$10.00 | \$5.08 | \$4.92 | \$315.77 | 141 | \$10.00 | \$1.86 | \$8.14 | \$109.49 |
| 110 | \$10.00 | \$5.00 | \$5.00 | \$310.77 | 142 | \$10.00 | \$1.73 | \$8.27 | \$101.22 |
| 111 | \$10.00 | \$4.92 | \$5.08 | \$305.69 | 143 | \$10.00 | \$1.60 | \$8.40 | \$92.83 |
| 112 | \$10.00 | \$4.84 | \$5.16 | \$300.53 | 144 | \$10.00 | \$1.47 | \$8.53 | \$84.29 |
| 113 | \$10.00 | \$4.76 | \$5.24 | \$295.29 | 145 | \$10.00 | \$1.33 | \$8.67 | \$75.63 |
| 114 | \$10.00 | \$4.68 | \$5.32 | \$289.96 | 146 | \$10.00 | \$1.20 | \$8.80 | \$66.83 |
| 115 | \$10.00 | \$4.59 | \$5.41 | \$284.55 | 147 | \$10.00 | \$1.06 | \$8.94 | \$57.89 |
| 116 | \$10.00 | \$4.51 | \$5.49 | \$279.06 | 148 | \$10.00 | \$0.92 | \$9.08 | \$48.80 |
| 117 | \$10.00 | \$4.42 | \$5.58 | \$273.48 | 149 | \$10.00 | \$0.77 | \$9.23 | \$39.57 |
| 118 | \$10.00 | \$4.33 | \$5.67 | \$267.81 | 150 | \$10.00 | \$0.63 | \$9.37 | \$30.20 |
| 119 | \$10.00 | \$4.24 | \$5.76 | \$262.05 | 151 | \$10.00 | \$0.48 | \$9.52 | \$20.68 |
| 120 | \$10.00 | \$4.15 | \$5.85 | \$256.20 | 152 | \$10.00 | \$0.33 | \$9.67 | \$11.01 |
| 121 | \$10.00 | \$4.06 | \$5.94 | \$250.25 | 153 | \$10.00 | \$0.17 | \$9.83 | \$1.18 |
| 122 | \$10.00 | \$3.96 | \$6.04 | \$244.22 | 154 | \$1.20 | \$0.02 | \$1.18 | \$0.00 |