Math 155 - Day #13: Exam 1 Review

Convert below to base 10

$314_5 =$

$314_5 = 84$

$2201_3 =$

$2201_3 = 73$

$263_7 =$

$263_7 = 143$

Covert below from base 10

97 to base 5

$97 = 3\times25+4\times5+2\times1 = 342_5$

68 to base 3

$68 = 2 \times 27 + 1 \times 9 + 1 \times 3 + 2 \times 1 = 2112_3$

18 to base 2

$18 = 1 \times 16 + 0 \times 8 + 0 \times 4 + 1 \times 2 + 0 \times 1 = 10010_2$

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Example: Find the amount of interest owed on a \$4000 loan with an annual interest rate $r = 3.5\%$ taken out for 6 years.

$I = 4000 \times .035 \times 6 = 840$

The amount of interest earned is \$840.

How much needs to be repaid on loan of \$1500 with an annual interest rate of 7% taken out for 3 years?

$I = 1500 \times .07 \times 3 = 315$

\$315 is owed in interest.

The total amount to be repaid is: $1500 + 315 = 1815$

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We found that in general, the amount, A, owed on a loan with annual interest rate, r, compounded n times per year for t years is:

$$A = P \times (1 + \frac{r}{n})^{nt}$$

Example: How much is owed on a loan of 5000 with an interest rate of 8% taken out for 7 years if the interest is compounded each year?

$A = 5000 \times (1 + .08)^7 = 5000 * 1.08^7 = 8569.12$

Example: Suppose that you put \$5500 into a Roth IRA retirement account when you are 25 where you earn 8% interest compounded monthly. How much will be in your account when you retire at 65?

$A = 5500 \times (1 + \frac{.08}{12})^{(12 \times 40)} = 133503.62$

Example: Suppose that you put \$5500 into a Roth IRA retirement account when you are 30 where you earn 8% interest compounded monthly. How much will be in your account when you retire at 65?

$A = 5500 \times (1 + \frac{.08}{12})^{(12 \times 35)} = 89609.02$