COLLEGE ALGEBRA QUIZ

(1) Which of the following is true regarding an infinite geometric series with $r = -1.1$?
Solution: (a), the sum of an infinite geometric series only exists if $|r| < 1$.
(a) It does not have a limit.
(b) It does have a limit.

(2) For a geometric sequence, $a_1 = -3$, $r = 2$, and $a_n = -48$. Find n and S_n.
Solution: $n = 5$, $S_n = -23.25$

(3) For a geometric sequence, $r = \frac{1}{3}$ and $S_4 = \frac{40}{3}$. Find a_1 and a_5.
Solution: $a_1 = 9$, $a_5 = \frac{1}{9}$

(4) Find the sum, if it exists, of the following infinite geometric series.

$$25 + 32.5 + 42.25 + 54.925$$

Solution: Does Not Exist, r = 1.3, the sum of an infinite geometric series only exists if $|r| < 1$. In this case, the series is increasing without bounds.

(5) Find the sum, if it exists, of the following infinite geometric series.

$$0.15 + 0.0015 + 0.000015 + ...$$

Solution: $\frac{5}{33}$

(6) Find the sum, if it exists, of the following infinite geometric series.

$$\frac{1}{2} - \frac{1}{8} + \frac{1}{32} - ...$$

Solution: $\frac{2}{5}$

(7) Find fraction notation for $3.\overline{45}$.
Solution: $\frac{38}{11}$

(8) A gumball is dropped to the floor from a height of 23 ft. If the gumball rebounds $\frac{13}{20}$ of the distance that it falls each time, then how far up and down will it have traveled when it hits the floor for the 7th time?
Solution: 101.99 ft

(9) A parent makes a savings account for their son when he is four years old, they deposit \$200 each month into his savings account on which interest is compounded annually at 0.5%. Find the amount of the annuity when the boy turns eighteen.
Solution: $\$34,714.14$

(10) Suppose that the government is supplying a city with $\$300,000,000$ in aid money to improve public transit, remove blight, and hire police and firefighters. If 83% of this amount is spent again on this city, and so on, what is the total effect on the economy?
Solution: $\$1,764,705,882$

(11) Write the first 3 terms of the infinite geometric series with $r = \frac{-1}{5}$ and $S_\infty = \frac{5}{18}$.
Solution: $\frac{1}{3}, \frac{-1}{15}, \frac{1}{75}$