Find the missing term of the geometric sequence

26. $a_1 = 5$ $r = \frac{3}{2}$ $n = 8$

$a_n = 5\left(\frac{3}{2}\right)^{n-1}$

$= 5\left(\frac{3}{2}\right)^{8-1}$

$\frac{10935}{128}$

A) $a_4 = 81$ $a_7 = 2187$ $n = 10$

$a_4 = a_1 r^{4-1}$ $a_7 = a_1 r^{7-1}$

$81 = a_1 r^3$ $2187 = a_1 r^6$

$a_1 = \frac{81}{r^3}$ $2187 = \frac{81}{r^3} \cdot r^6$

$a_1 = \frac{81}{27} = 3$ $\frac{2187}{81} = \frac{81r^3}{81}$

$\sqrt{r^3} = \sqrt{\frac{2187}{81}}$

$r = 3$

$a_n = 3(3)^{n-1}$

$a_{10} = 3(3)^9$

$= 59{,}049$

$r^2 = \frac{\frac{64}{27}}{\frac{16}{3}}$ $\frac{\cancel{64}^{4}}{\cancel{27}_{9}} \cdot \frac{\cancel{3}^{1}}{\cancel{16}_{1}}$

$\sqrt{r^2} = \sqrt{\frac{4}{9}}$ $r = \frac{2}{3}$

32) $a_3 = \frac{16}{3}$ $a_5 = \frac{64}{27}$ $n = 7$

$a_n = a_1 r^{n-1}$

$a_3 = a_1 r^{3-1}$

$\frac{16}{3} = a_1\left(\frac{2}{3}\right)^2$

$\left(\frac{\cancel{9}^{3}}{\cancel{4}_{1}}\right)\left(\frac{\cancel{16}^{4}}{\cancel{3}_{1}}\right) = \left(\frac{4}{9} a_1\right)\left(\frac{9}{4}\right)$

$a_1 = 12$

$a_n = 12\left(\frac{2}{3}\right)^{n-1}$

$a_7 = \frac{256}{243}$

34) 3, 36, 432, . . . $n = 7$

$a_1 = 3$

$r = 12$

$a_n = 3(12)^{n-1}$

$a_7 = 3(12)^{7-1}$

$= 3(12)^6$

$8{,}957{,}952$

Sum of a finite Geometric Series $S_n = \dfrac{a_1(1-r^n)}{1-r}$	Find the sum of the first 5 terms. Then find r. 42) 8, 12, 18, 27, 81/2 $S = 105.5 = \frac{211}{2}$ $r = \frac{3}{2}$ $S_5 = \dfrac{8(1-(\frac{3}{2})^5)}{1-\frac{3}{2}}$ Find the sum of the first 10 terms. Then find r. 41) $8, -4, 2, -1, \frac{1}{2}, \frac{-1}{4}, \frac{1}{8}, \frac{-1}{16}, \frac{1}{32}, \frac{-1}{64}$ $a_1 = 8$ $r = \frac{-1}{2}$ $S_{10} = \dfrac{a_1(1-r^{10})}{1-r}$ $= \dfrac{8(1-(\frac{-1}{2})^{10})}{1-(\frac{-1}{2})}$ $= \dfrac{341}{64}$ 41A) $8, 4, 2, 1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \frac{1}{32}, \frac{1}{64}$ $S = \dfrac{8(1-\frac{1}{2}^{10})}{1-\frac{1}{2}} = \dfrac{1023}{64}$