If $s = 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \frac{1}{32}$ and $t = 1 + \frac{1}{2}s$, then t exceeds s by

$$\frac{32}{32} + \frac{16}{32} + \frac{8}{32} + \frac{4}{32} + \frac{2}{32} + \frac{1}{32}$$

$$s = \left(\frac{32}{32} + \frac{31}{32}\right) = \boxed{\frac{63}{32}} = \frac{128}{64}$$

$$t = 1 + \frac{1}{2}\left(\frac{63}{32}\right)$$

$$= 1 + \frac{63}{64} = \frac{127}{64}$$

80 + 40 + 20 + 10 + 5 + ...

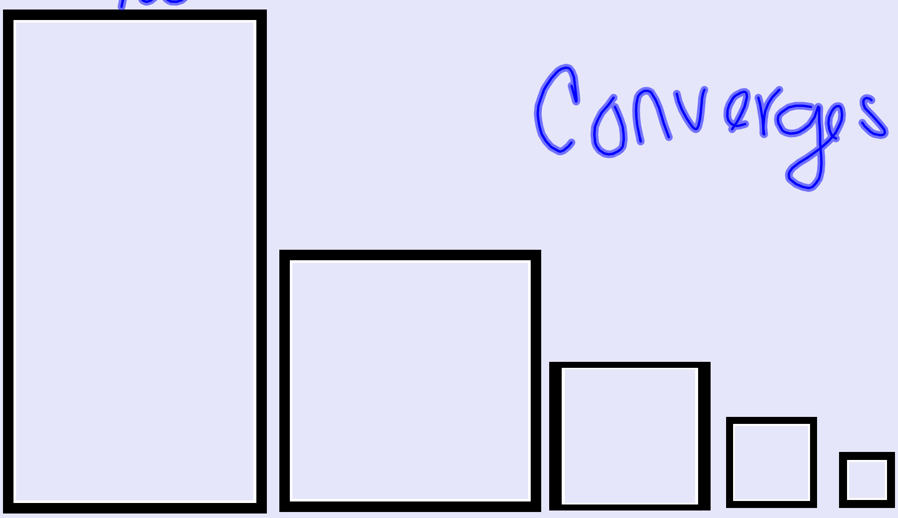
$S_5 = 155$

$S_{10} = 159.8$

$S_{100} = 160$

$$S_n = \frac{80\left(\frac{1}{2}^n - 1\right)}{\left(\frac{1}{2} - 1\right)}$$

Converges @ 160

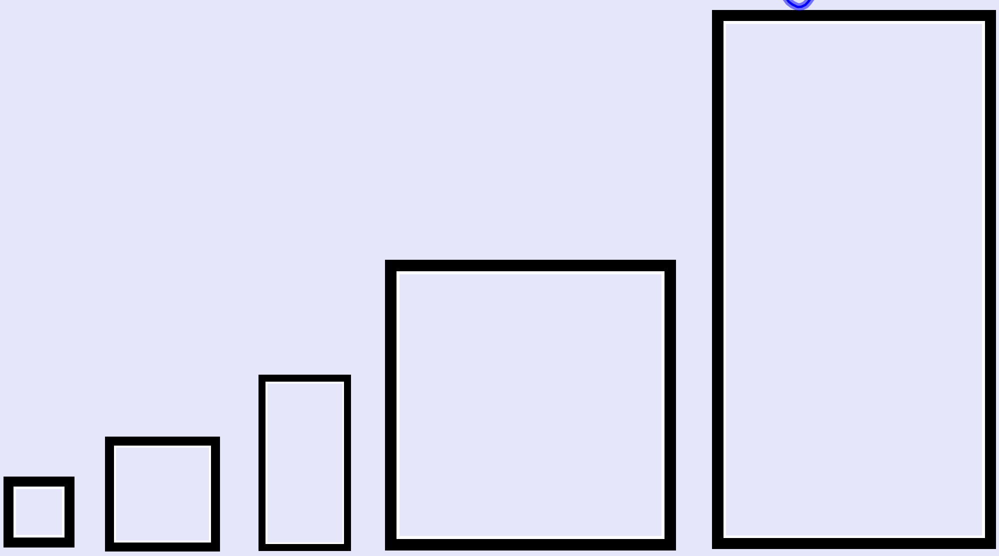


$$5 + 10 + 20 + 40 + 80 + \ldots$$

$S_5 = 155$

$S_{10} =$

Diverges...



192 + 48 + 12 + 3 + ...

$r = \frac{1}{4}$

$a_1 = 192$

$n = ?$

$$S_\infty = \frac{a_1}{1-r}$$

$$S_\infty = \frac{192}{1-1/4}$$

$$= \boxed{256}$$

20 - 10 + 5 - 2.5 + 1.25 - ...

$a_1 = 20$

$r = -\frac{1}{2}$

$n = \infty$

$$S_\infty = \frac{a_1}{1 - r}$$

$$= \frac{20}{1 + \frac{1}{2}} = 13.3$$

The n^{th} term of an arithmetic sequence	$u_n = u_1 + (n-1)d$
The sum of n terms of an arithmetic sequence	$S_n = \frac{n}{2}(2u_1 + (n-1)d) = \frac{n}{2}(u_1 + u_n)$
The n^{th} term of a geometric sequence	$u_n = u_1 r^{n-1}$
The sum of n terms of a finite geometric sequence	$S_n = \frac{u_1(r^n - 1)}{r-1} = \frac{u_1(1-r^n)}{1-r}$, $r \neq 1$
The sum of an infinite geometric sequence	$S = \frac{u_1}{1-r}$, $\lvert r \rvert < 1$

$$\frac{1}{25}+\frac{1}{250}+\frac{1}{2500}+\ldots$$

Find the infinite sum.

$a_1 = \frac{1}{25}$

$r = \frac{1}{10}$

$S_\infty = \frac{2}{45}$

Write in sigma notation. $\sum_{i=1}^{\infty} \frac{1}{25}\left(\frac{1}{10}\right)^{i-1}$