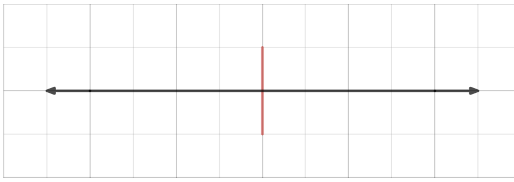
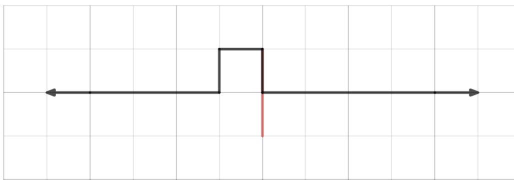
Line-Forms

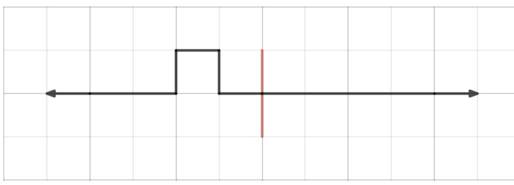
0=



1=



2=



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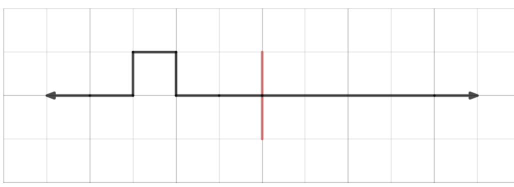

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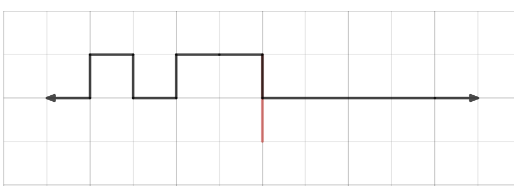
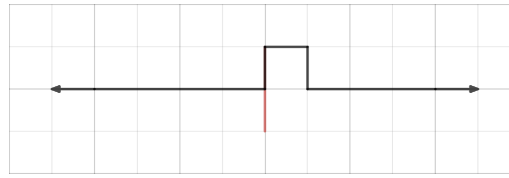
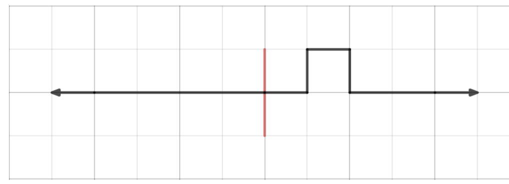


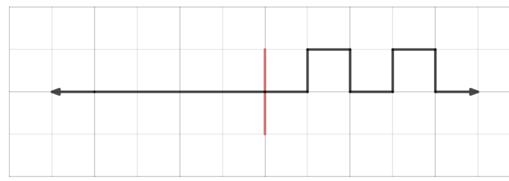
$\frac{1}{2}$=



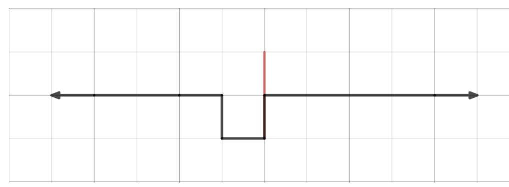
$\frac{1}{4}$=



$\frac{5}{16}$=



-1=



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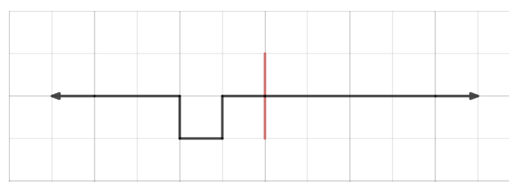
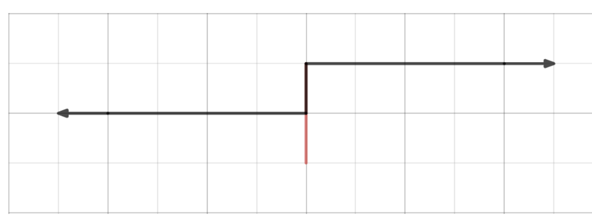
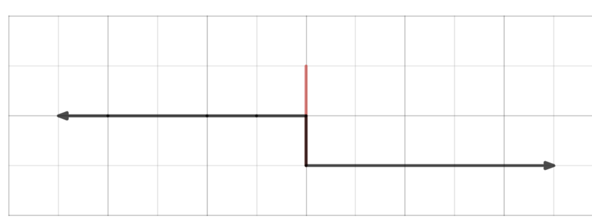


$\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\ldots=\sum_{n\geq1}^{\infty}\frac{1}{2}^{n}=\frac{x}{1-x}\Big|_{\frac{1}{2}}= 1\ =$

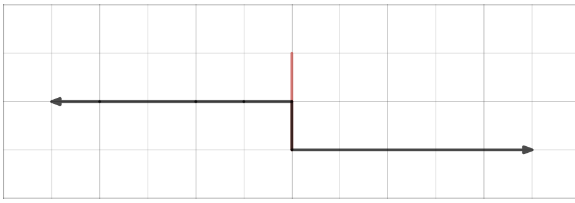


$\frac{-1}{2}+\frac{-1}{4}+\frac{-1}{8}+\ldots=-\sum_{n\geq1}^{\infty}\frac{1}{2}^{n}= -1\ =$



Consider:
Globally translating the lineform one unit to the left or right corresponds to multiplying by 2 or ½ respectively. Locally translating a cell up or down corresponds to adding or subtracting a power of 2. However, global vertical translations have no obvious meaning; they would involve manipulating divergent series of powers of 2.

Assume global vertical translation has no effect. Then, all global vertical translations of a given lineform are equal. So:



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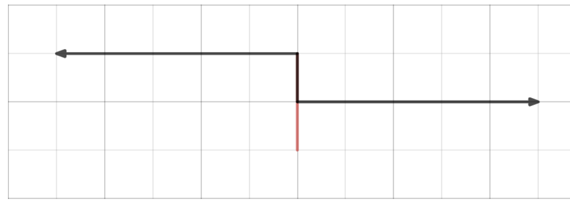
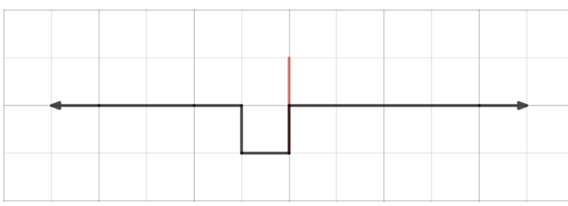


$$\frac{-1}{2}+\frac{-1}{4}+\frac{-1}{8}+\ldots = -\sum_{n\geq 1}^{\infty}\frac{1}{2}^{n} = \frac{-x}{1-x}\Big|_{\frac{1}{2}} = -1 = \frac{1}{1-x}\Big|_{2} = \sum_{n\geq 0}^{\infty}2^{n} = \ldots+8+4+2+1$$

Likewise:



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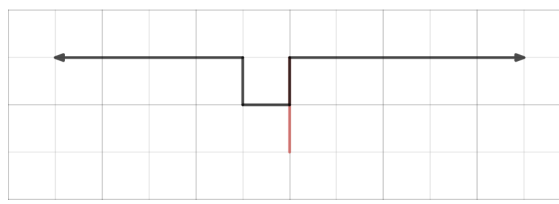
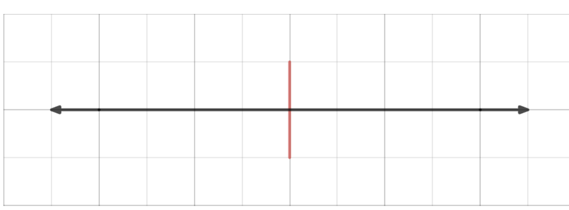


$$\ldots+0(2^{2})+0(2^{1})-2^{0}+\frac{0}{2}+\frac{0}{4}+\ldots = -1 = \ldots+2^{2}+2^{1}+0(2^{0})+\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\ldots$$

Interestingly:



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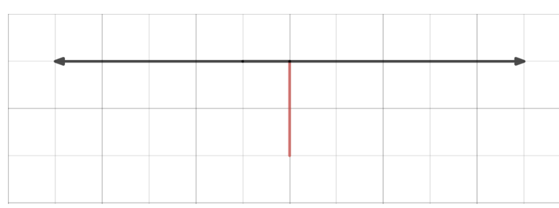

$$\ldots+0(2^{1})+0(2^{0})+\frac{0}{2}+\ldots = -\sum_{-\infty}^{\infty}0^{n} = 0 = \sum_{-\infty}^{\infty}2^{n} = \ldots+2^{2}+2^{1}+2^{1}+\frac{1}{2}+\frac{1}{4}+\ldots$$