10/11/2020

192 $(x - 10^{-1})^2 + 10^{-2}(x + 10) = 10^{-1}(1 + 10^{-2})$

$$\left(x - \frac{1}{10}\right)^2 + \frac{1}{100}(x+10) = \frac{1}{10}\left(1 + \frac{1}{100}\right)$$

$$x^2 + \frac{1}{100} - \frac{1}{5}x + \frac{x+10}{100} = \frac{1}{10} + \frac{1}{1000}$$

$$\frac{1000x^2 + 10 - 200x + 10(x+10)}{1000} = \frac{100 + 1}{1000}$$

$$1000x^2 + 10 - 200x + 10x + 100 - 100 - 1 = 0$$

$$1000x^2 - 190x + 9 = 0 \qquad \beta = \frac{b}{2} = -\frac{190}{2} = -95$$

$$x = \frac{-\beta \pm \sqrt{\beta^2 - ac}}{a} = \qquad \frac{\Delta}{4} = \beta^2 - ac = (-95)^2 - 9000 =$$

$$= 9025 - 9000 = 25$$

$$= \frac{95 \pm \sqrt{25}}{1000} = \frac{95 \pm 5}{1000} = \begin{cases} \frac{90}{1000} = \frac{9}{100} \\ \frac{100}{1000} = \frac{1}{10} \end{cases}$$

$$\boxed{x = \frac{9}{100} \quad \vee \quad x = \frac{1}{10}}$$

189 $(x-3)(x+3)+\frac{1}{2}(5-x)^2=\frac{x+1}{4}+1$

$$x^2-9+\frac{1}{2}\left(25+x^2-10x\right)=\frac{x+1}{4}+1$$

$$\frac{4x^2-36+2\left(25+x^2-10x\right)}{4}=\frac{x+1+4}{4}$$

$$4x^2-36+50+2x^2-20x=x+5$$

$$6x^2-21x+9=0 \qquad \Delta=b^2-4ac=(-21)^2-4\cdot 6\cdot 9=$$

$$=225=15^2$$

$$x=\frac{-b\pm\sqrt{\Delta}}{2a}=\frac{21\pm 15}{12}=\begin{cases}\frac{6}{12}=\frac{1}{2}\\ \frac{36}{12}=3\end{cases}$$

$$\boxed{x=\frac{1}{2} \ \vee \ x=3}$$

655 La somma dei primi n numeri naturali, a partire da 1, è data dalla formula: $\frac{1}{2}n(n+1)$. Quanti numeri naturali occorre sommare per ottenere come risultato 190? [19]

$$1+2+3+4+5+\ldots+n=\frac{n(n+1)}{2}$$

$n=2$

$$1+2=\frac{2\cdot(2+1)}{2}=3$$

$n=5$

$$1+2+3+4+5=\frac{5(5+1)}{2}=\frac{30}{2}=15$$

1	2	3	4	5	6	98	99	100
100	99	98	97	96	95	3	2	1
101	101	101	101	101	101	101	101	101

$$S=\frac{\overset{50}{\cancel{100}}\cdot 101}{\cancel{2}}=5050$$

1	2	3	$n-1$	n
n	$n-1$	$n-2$ ...	2	1
$n+1$	$n+1$	$n+1$	$n+1$	$n+1$

$$S=\frac{n\cdot(n+1)}{2}$$

$S = \frac{n(n+1)}{2}$ $\quad S = 190$ $\quad$ qual è n?

$$\frac{n(n+1)}{2} = 190$$

$$n(n+1) = 380$$

$$n^2 + n - 380 = 0$$

$$\Delta = 1^2 + 4 \cdot 380 = 1 + 1520 = 1521 = 39^2$$

$$n = \frac{-1 \pm 39}{2} = \begin{cases} -\frac{40}{2} = -20 \text{ N.A. perché } < 0 \\ \frac{38}{2} = \boxed{19} \end{cases}$$

656 Addizionando a un numero il suo reciproco si ottiene come risultato $\frac{17}{4}$. Determina il numero. $\left[\frac{1}{4} \text{ o } 4\right]$

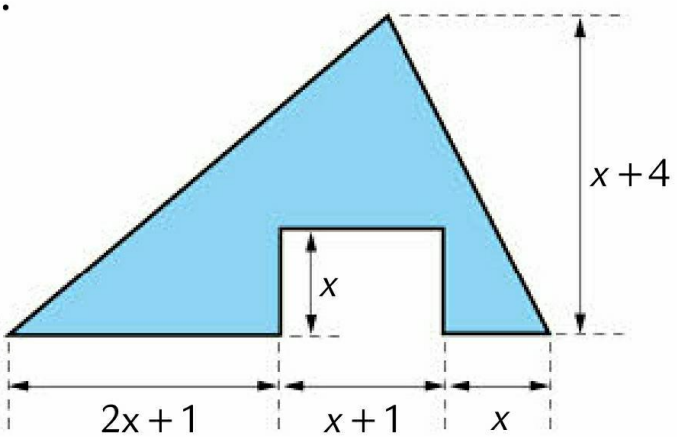
x = numero $\quad \frac{1}{x}$ = reciproco $\quad$ C.E. $x \neq 0$

$$x + \frac{1}{x} = \frac{17}{4} \qquad \frac{4x^2 + 4}{4x} = \frac{17x}{4x}$$

$$4x^2 - 17x + 4 = 0 \qquad \Delta = (-17)^2 - 4 \cdot 4 \cdot 4 = 289 - 64 = 225 = 15^2$$

$$x = \frac{17 \pm 15}{8} = \begin{cases} \frac{2}{8} = \frac{1}{4} \\ \frac{32}{8} = 4 \end{cases} \qquad x = \frac{1}{4} \ \vee \ x = 4$$

696 Determina x sapendo che l'area della figura colorata è 24 cm^2.



[2 cm]

$$\underbrace{\frac{1}{2}(2x+1+x+1+x)(x+4)}_{\text{AREA TRIANGOLO}} - \underbrace{x(x+1)}_{\text{AREA RETTANGOLO}} = 24$$

$$\underbrace{\frac{1}{2}(4x+2)}_{(2x+1)}(x+4) - x^2 - x - 24 = 0$$

$$(2x+1)(x+4) - x^2 - x - 24 = 0$$

$$2x^2 + 8x + x + 4 - x^2 - x - 24 = 0$$

$$x^2 + 8x - 20 = 0 \qquad \frac{\Delta}{4} = 16 + 20 = 36$$

$$x = -4 \pm 6 = \begin{cases} -10 \text{ N.A. perché } < 0 \\ 2 \end{cases}$$

$$\boxed{x = 2 \text{ cm}}$$