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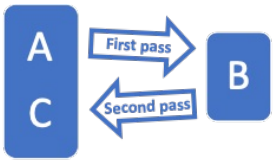
Practice Question B0



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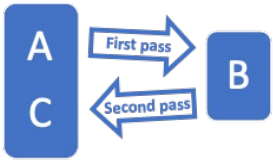
Practice Question B0



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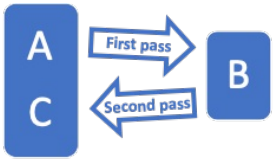
Practice Question B0



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B0.

Let N be the number you receive. Across 11 complete years, how many months contain exactly N days each?

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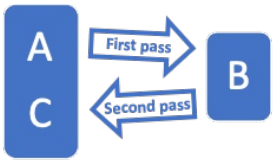
Question B1



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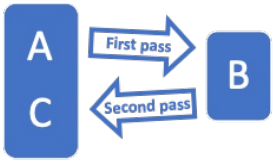
Question B1



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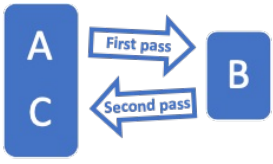

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B1.

Let k be the number you receive.

Find the number of integer ordered pairs (x, y), such that $xy + x - 3y - 3 = k + 1$.

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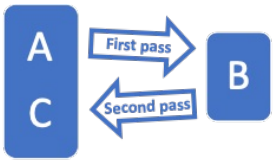
Question B2



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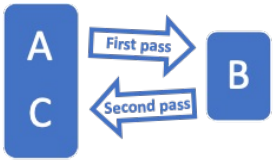
Question B2



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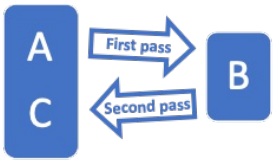

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B2.

Let k be the number you receive.

Let point $A = (-1, 4)$ and point $B = (2, 1)$.

If the perpendicular bisector of $\overline{AB}$ contains the point $(k+2, b)$, find the value of b.

B2.

Let k be the number you receive.

Let point $A = (-1, 4)$ and point $B = (2, 1)$.

If the perpendicular bisector of $\overline{AB}$ contains the point $(k+2, b)$, find the value of b.

B2.

Let k be the number you receive.

Let point $A = (-1, 4)$ and point $B = (2, 1)$.

If the perpendicular bisector of $\overline{AB}$ contains the point $(k+2, b)$, find the value of b.

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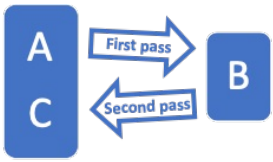
Question B3



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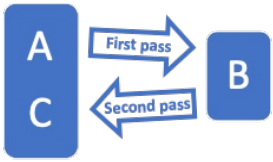
Question B3



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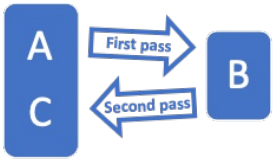
Question B3



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B3.

Let k be the number you receive.

find the minimum value of the function $f(x) = (x+2)(x+4)(x+6)(x+8) + \dfrac{k}{9}$.

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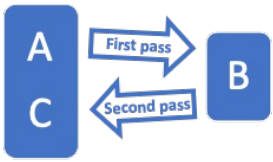
Question B4



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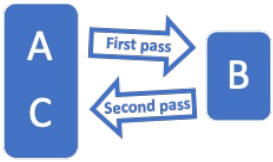
Question B4



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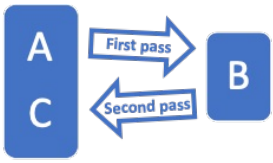

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B4.

Let k be the number you receive.

The maximum value of $f(x) = \dfrac{x+k}{x^2+1}$ occurs at $x = a + \sqrt{b}$.

Find the value of $a + b$.

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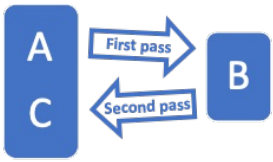
Question B5



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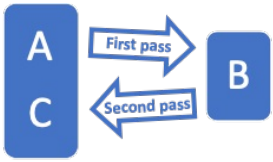
Question B5



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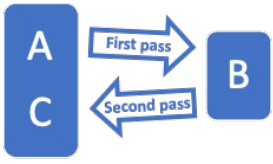
Question B5



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B5.

Let k be the number you receive.

If you simplify $\left(\frac{-1+i\sqrt{3}}{2}\right)^{k-2}+\left(\frac{-1-i\sqrt{3}}{2}\right)^{k-2}$, you get $a+bi$.

Find $a+b$.

B5.

Let k be the number you receive.

If you simplify $\left(\frac{-1+i\sqrt{3}}{2}\right)^{k-2}+\left(\frac{-1-i\sqrt{3}}{2}\right)^{k-2}$, you get $a+bi$.

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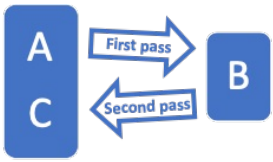
Question B6



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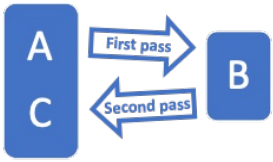
Question B6



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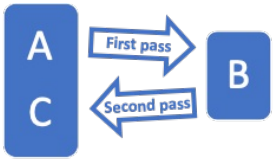

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B6.

Let k be the number you receive.

A right triangle has integer lengths with one side being length $22k$.

Find the area of the triangle.

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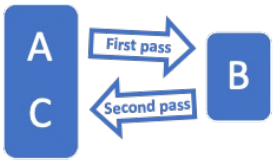
Question B7



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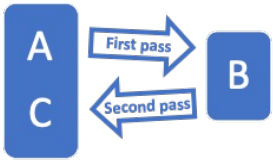

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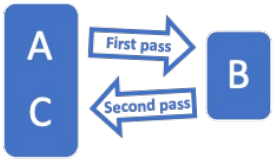

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B7.

Let k be the number you receive.

Note that time is the ratio of total displacement divided by the rate of change (speed) of movement.

Jose wants to average $k-2$ mph on his bicycle as he rides around a track four times.

If he averages 9 mph on the first three laps, how fast must he go, in mph, on the forth lap?

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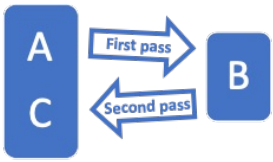
Question B8



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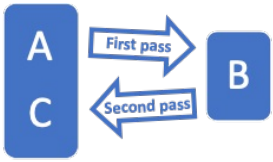

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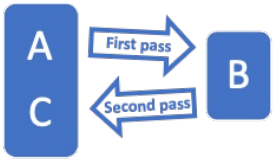

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B8.

Let k be the number you receive.

A polynomial $P(x)$ satisfies the equation $P(P(x)-1)=1+x^{16}$.

What is $P(k-1)$?

B8.

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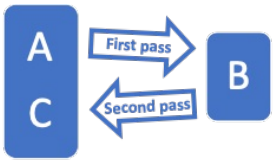
Question B9



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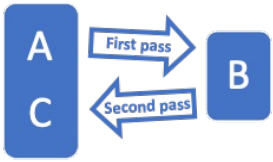

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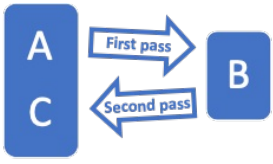

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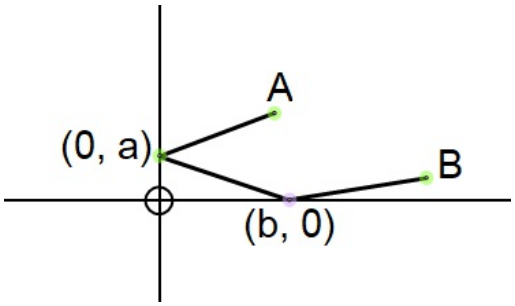
B9.

Let k be the number you receive.

If $A(5, 4)$ is only connected to $B\left(\frac{k}{2}, 1\right)$ using three line segments as shown, find the length of the path from A to B.



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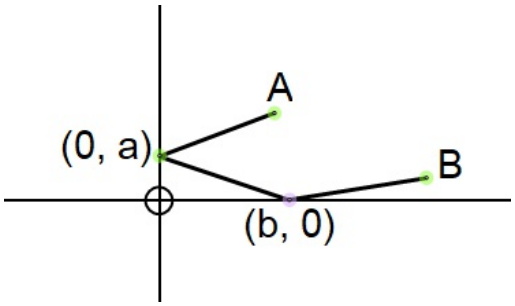

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