

Math for Insurance

P1. Jack spends \$1,045.60 each year on regular medical expenses. Sometimes he falls extremely ill and spends more. The parabola $y = -3x^2 + 16x + 87$ has a vertex whose y-coordinate represents, on average, how much he spends each year due to his extreme illness. If his insurance provider offers him a yearly premium of \$1,130.20 for complete medical coverage, should he take it or self-insure, making all medical payments himself?

P2. Johan pays \$60.00 per year for an insurance plan that covers 60% of the first \$100.00 worth of damages, and 100% of all damages afterwards. How much would Johan have to incur in damage for his total cost to equal his insurer's? HINT: What are Johan's current costs, what are his insurer's current costs? What if damage were to occur - think about how much each party would spend.

Activity Answer Key

A1.

The x-coordinate of the vertex is $-\frac{18}{-3} = 6$

The y-coordinate is $-3(6)^2 + 16(6) + 87 = 75$

His medical expenses $75 + 1045.6 = \$1120.60$ are lower than the offered premium. He should self-insure.

A2.

If \$100.00 worth of damage were to occur,

$$Cost_{Johan} = \text{premium} + \text{damages}$$

$$Cost_{Johan} = 60 + (0.4)(100)$$

$$Cost_{Johan} = \$100.00$$

$$Cost_{Insurer} = 0.6(100)$$

$$Cost_{Insurer} = \$60.00$$

Since the insurer pays 100% of damage above \$100.00, \$140.00 worth of damages need to occur to equate their costs.



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