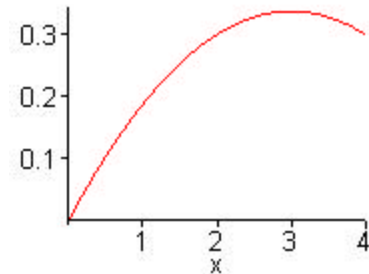


I. An “ace-six flats” die is rolled. Let $P(i)$ be the probability that the i^{th} face appears and suppose that $P(1) = P(6) = \frac{1}{4}$ and $P(2) = P(3) = P(4) = P(5) = \frac{1}{8}$.

(a) What is the probability that the roll (i.e. the face that appears) is less than five? (4 points)

(b) What is the probability that the roll is a one given that the roll is less than five? (4 points)

II. The time it takes for a student to complete their degree at ASU has the continuous probability (density) function $f(x) = \frac{3}{80}(6x - x^2), 0 < x < 4$ where x is in years. What is the probability that a student will complete their degree within three years? Shade the area that represents this probability on the graph below. (6 points)



III. A track coach has 10 sprinters and 6 long distance runners from which to form a team of three sprinters and two long distance runners.

(a) How many teams can she form? (4 points)

(b) Suppose she wants to designate one of the sprinters as the team captain. How many teams can she now form? (4 point)