Math 366 - Quiz 2

Name and Student ID:

Question ($5 + 2$ pts.): Let C be the elliptic curve given by the equation $y^2 = x^3 + 2x^2 + 3x + 3$ and let $P = (1, 3)$ and $R = (2, 5)$ be two given points on C.
a) Find $P + R$ and $2P = P + P$ where $+$ denotes the group operation on the elliptic curve C.
b) Why are there infinitely many solutions $(x, y) \in \mathbb{Q}^2$ of the given cubic equation of C?

Math 366 - Quiz 2

Name and Student ID:

Question ($5 + 2$ pts.): Let C be the elliptic curve given by the equation $y^2 = x^3 - x^2 + x + 15$ and let $P = (1, 4)$ and $R = (3, 6)$ be two given points on C.
a) Find $P + R$ and $2P = P + P$ where $+$ denotes the group operation on the elliptic curve C.
b) Why are there infinitely many solutions $(x, y) \in \mathbb{Q}^2$ of the given cubic equation of C?

Math 366 - Quiz 2

Name and Student ID:

Question ($5 + 2$ pts.): Let C be the elliptic curve given by the equation $y^2 = x^3 + x^2 - 4x + 12$ and let $P = (2, 4)$ and $R = (3, 6)$ be two given points on C.
a) Find $P + R$ and $2P = P + P$ where $+$ denotes the group operation on the elliptic curve C.
b) Why are there infinitely many solutions $(x, y) \in \mathbb{Q}^2$ of the given cubic equation of C?

Math 366 - Quiz 2

Name and Student ID:

Question ($5 + 2$ pts.): Let C be the elliptic curve given by the equation $y^2 = x^3 - 3x^2 + 5x + 1$ and let $P = (1, 2)$ and $R = (3, 4)$ be two given points on C.
a) Find $P + R$ and $2P = P + P$ where $+$ denotes the group operation on the elliptic curve C.
b) Why are there infinitely many solutions $(x, y) \in \mathbb{Q}^2$ of the given cubic equation of C?