1.7 Solve Linear-Quadratic Systems – Worksheet

MCR3U
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1) Determine if each quadratic function will intersect once, twice, or not at all with the given linear function.

a) $y = 2x^2 - 2x + 1$ and $y = 3x - 5$

b) $y = -x^2 + 3x - 5$ and $y = -x - 1$

c) $y = \frac{1}{2}x^2 + 4x - 2$ and $y = x + 3$

d) $y = -\frac{2}{3}x^2 + x + 3$ and $y = x$

2) Determine the coordinates of the point(s) of intersection of each linear-quadratic system.

a) $y = x^2 - 7x + 15$ and $y = 2x - 5$

b) $y = 3x^2 - 16x + 37$ and $y = 8x + 1$

c) $y = \frac{1}{2}x^2 - 2x - 3$ and $y = -3x + 1$

3) Determine the value of the y-intercept of a line with the given slope that is a tangent line to the given curve.

a) $y = -2x^2 + 5x + 4$ and a line with a slope of 1

b) $y = -x^2 - 5x - 5$ and a line with a slope of -3

4) The path of an underground stream is given by the function $y = 4x^2 + 17x - 32$. Two new houses need wells to be dug. On the area plan, these houses lie on a line defined by the equation $y = -15x + 100$. Determine the coordinates where the two new wells should be dug.

Answers

1) a) do not intersect **b)** once **c)** twice **d)** twice

2) a) (4, 3), (5, 5) **b)** (2, 17), (6, 49) **c)** (-4, 13), (2, -5)

3) a) 6 **b)** -4

4) (-11, 265), (3, 55)