ADDITIONAL DISCRIMINANT EXERCISES

KYLE BRODER - ANU MSI 2017

Q1. Let $f(x) := 2x + 1$ and $g(x) = x^2 + k$. Determine the value(s) of $k \in \mathbb{R}$ such that f intersects g exactly once.

Q2. Let $f(x) := 4x + k$ and $g(x) = 2x^2 - 3$. Determine the value(s) of $k \in \mathbb{R}$ such that f intersects g exactly once.

Q3. Let $f(x) := kx^2 - x$ and $g(x) = x + 1$. Determine the value(s) of $k \in \mathbb{R}$ such that f intersects g exactly once.

Q4. Let $f(x) := kx + \frac{2}{3}$ and $g(x) = 1 - kx^2$. Determine the value(s) of $k \in \mathbb{R}$ such that f intersects g twice.

Q5. Let $f(x) := kx + 1$ and $g(x) = 2 + x^2$. Determine the value(s) of $k \in \mathbb{R}$ such that f intersects g twice.

Q6. Let $f(x) := 1 - kx^2$ and $g(x) = 3kx$. Determine the value(s) of $k \in \mathbb{R}$ such that f intersects g twice.

Q7. Let $f(x) := 4 + 2x^2$ and $g(x) = \frac{1}{k}x + 1$. Determine the value(s) of $k \in \mathbb{R}$ such that f intersects g twice.

Q8. Let $f(x) := x^2 - kx + 6$ and $g(x) = x^2 + kx + 1$. Determine the value(s) of $k \in \mathbb{R}$ such that f and g do not intersect.

Q9. Let $f(x) := (x - 3)(x + k)$ and $g(x) = 2x + 1$. Determine the value(s) of $k \in \mathbb{R}$ such that f and g do not intersect.

Q10. Let $f(x) := (kx + 1)^2$ and $g(x) = 2kx - 5$. Determine the value(s) of $k \in \mathbb{R}$ such that f and g do not intersect.