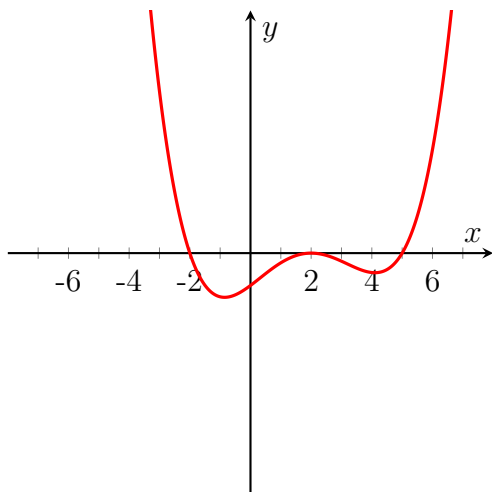




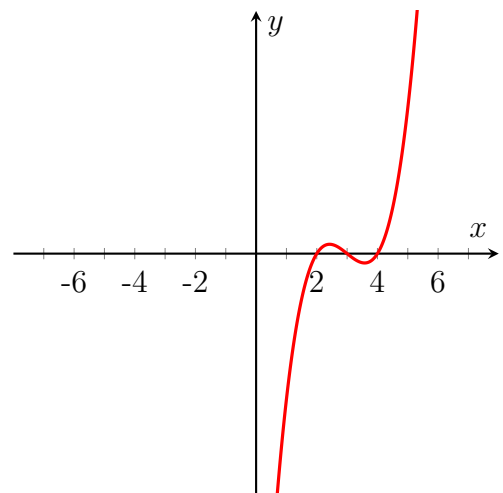
MTM3100 - Pré-cálculo

Gabarito parcial da 11ª lista complementar de exercícios

1. (a) Crescente em \mathbb{R} .
(b) Decrescente em \mathbb{R} .
(c) Decrescente em $(-\infty, 2]$; crescente em $[2, \infty)$.
(d) Decrescente em $[0, \infty)$; crescente em $(-\infty, 0]$.
2. (a) Não possui.
(b) Não possui.
(c) $f(2) = -1$ é mínimo local (isto é, 2 é mínimo local e é atingido em $x = -1$).
(d) $f(0) = 4$ é máximo local.
3. (a) $\frac{f(b) - f(a)}{b - a} = \frac{f(4) - f(1)}{4 - 1} = 3$.
(b) $\frac{f(b) - f(a)}{b - a} = 3$.
(c) $\frac{f(b) - f(a)}{b - a} = \frac{f(3) - f(0)}{3 - 0} = -1$.
(d) $\frac{f(b) - f(a)}{b - a} = \frac{f(4) - f(0)}{4 - 0} = 0$.
4. $y = -x + 3$. O coeficiente angular é igual à taxa de variação média. Sim, isso sempre vale.
- 5.
- 6.
- 7.
- 8.
- 9.
10. (a)

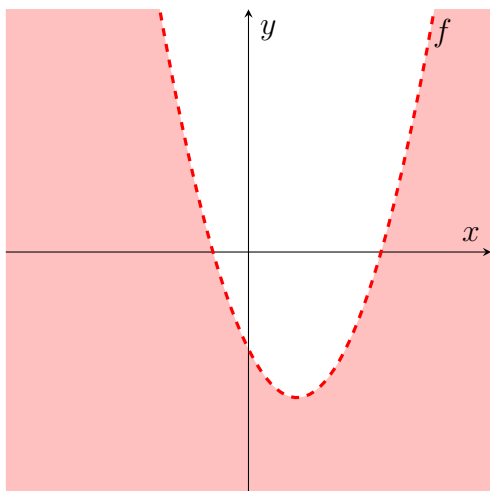


(b)

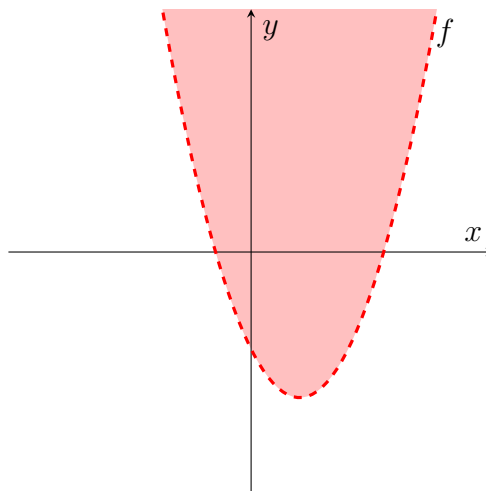


11. (a) $\{x \in \mathbb{R} \mid f(x) < g(x)\} = (a, b)$. (b) $\{x \in \mathbb{R} \mid f(x) = g(x)\} = \{a, b\}$.
 (c) $\{x \in \mathbb{R} \mid f(x) > g(x)\} = (-\infty, a) \cup (b, \infty)$. (d) $\{x \in \mathbb{R} \mid f(x) \leq g(x)\} = [a, b]$.
 (e) $\{x \in \mathbb{R} \mid f(x) \geq g(x)\} = (-\infty, a] \cup [b, \infty)$.

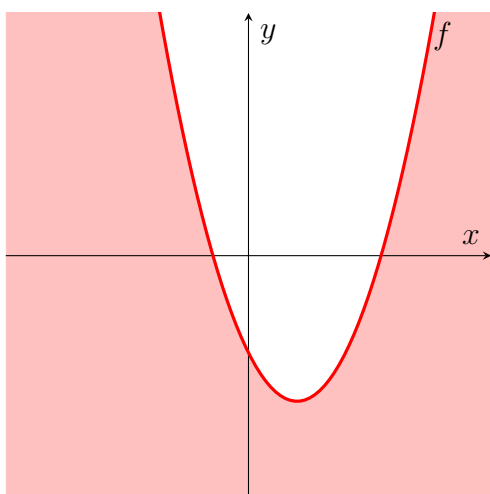
12. (a)



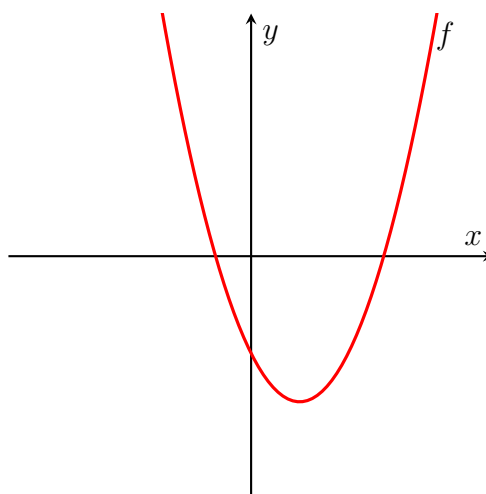
(b)



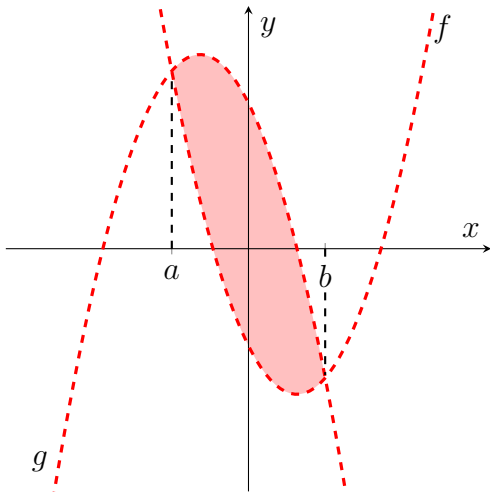
(c)



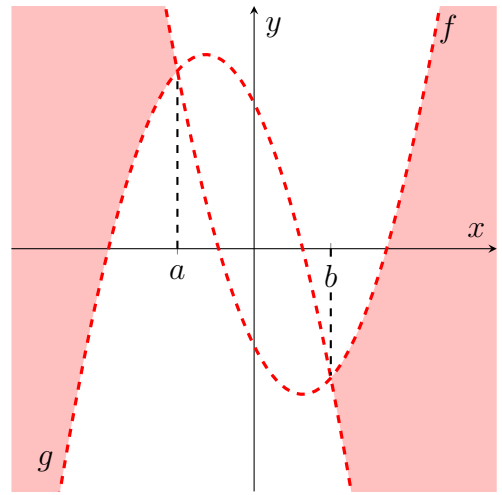
(d)



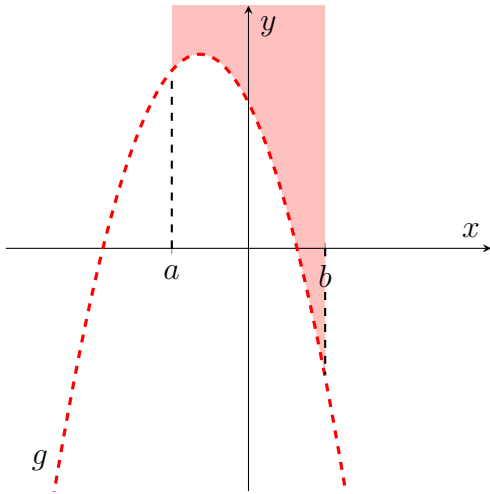
(e)



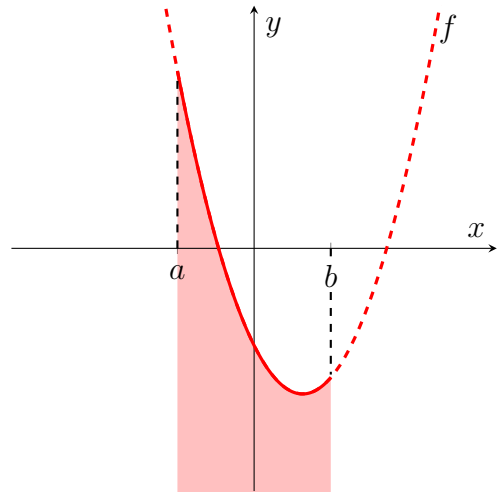
(f)



(g)



(h)



13. 11.(a) $\{x \in \mathbb{R} \mid f(x) < g(x)\} = (-\infty, 1)$.

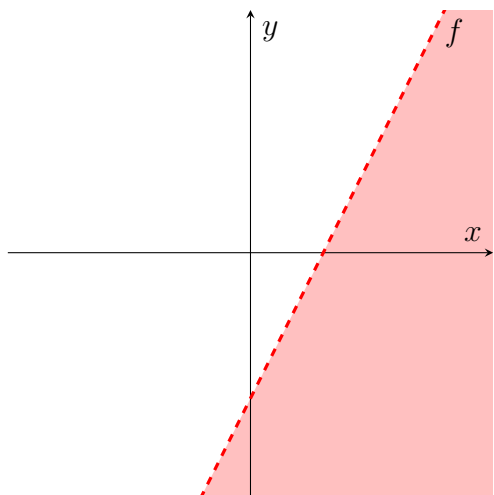
11.(c) $\{x \in \mathbb{R} \mid f(x) > g(x)\} = (1, \infty)$.

11.(e) $\{x \in \mathbb{R} \mid f(x) \geq g(x)\} = [1, \infty)$.

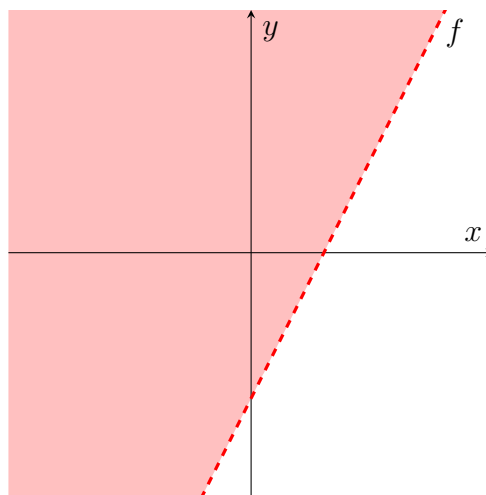
11.(b) $\{x \in \mathbb{R} \mid f(x) = g(x)\} = \{1\}$.

11.(d) $\{x \in \mathbb{R} \mid f(x) \leq g(x)\} = (-\infty, 1]$.

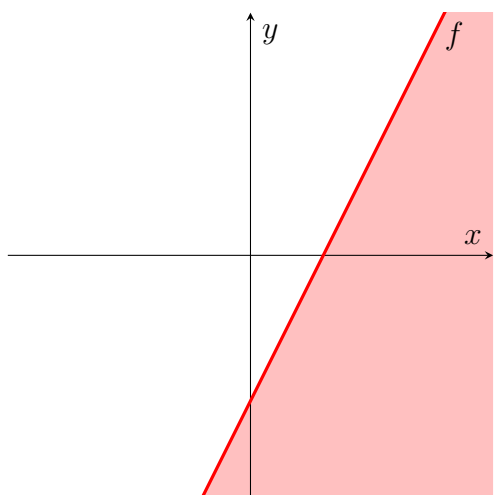
12.(a)



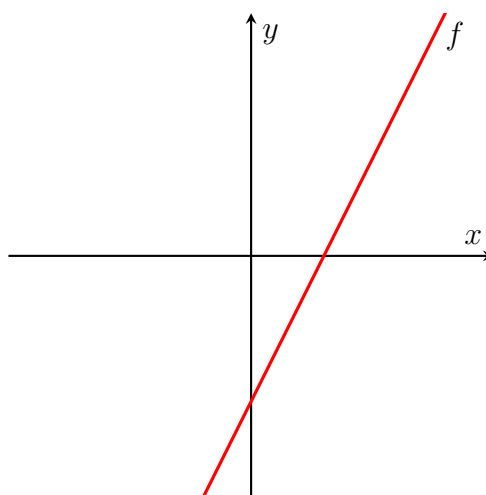
12.(b)



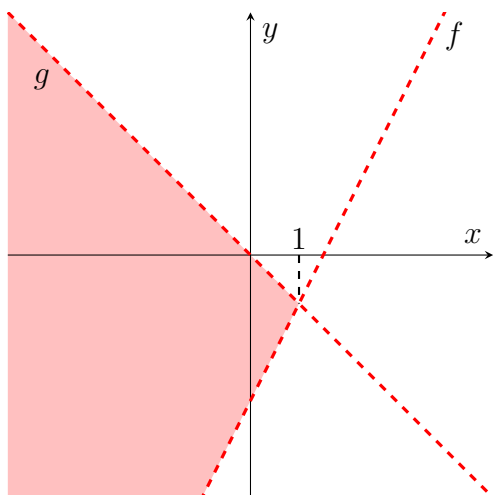
12.(c)



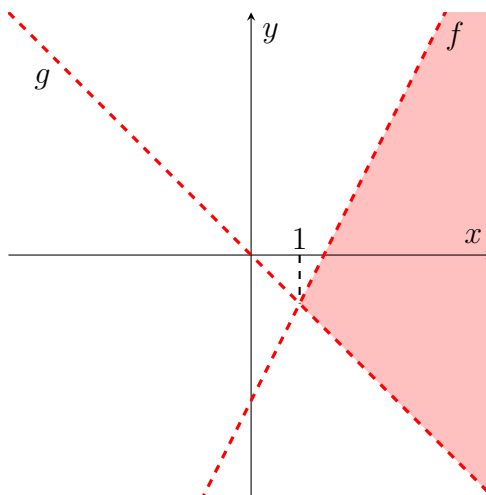
12.(d)



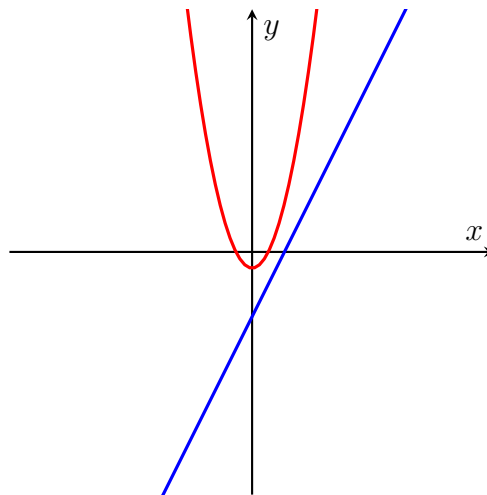
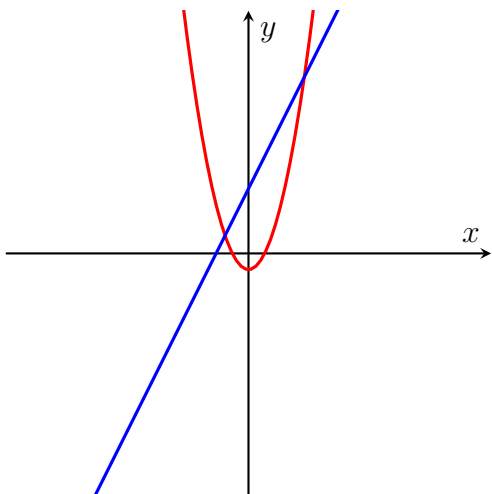
12.(e)



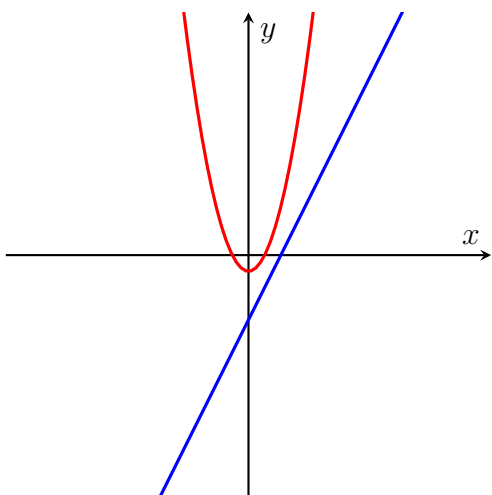
12.(f)



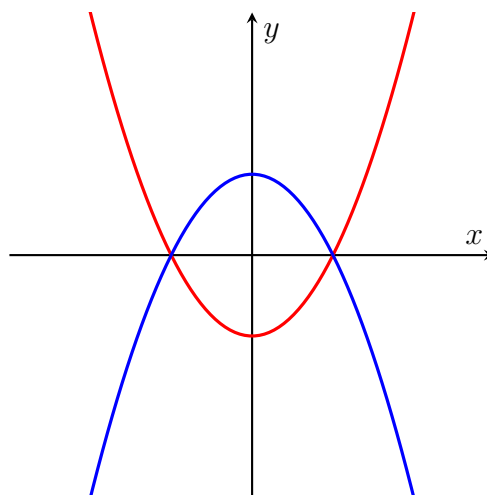
14. (a) Graficamente, percebemos que há duas soluções. Calculando-as algebricamente, obtemos $S = \{1 - \sqrt{6}, 1 + \sqrt{6}\}$. (b) $S = \mathbb{R}$.



- (c) $S = \emptyset$.



- (d) $S = \{-1, 1\}$.



15. (a) $f(x) = \frac{1}{3}x^2 - x + 2$.

(b) $f(x) = \frac{x^2 - 5x + 22}{9}$.

16. (a) Assumindo que g é inversível, $f = g^{-1} \circ h$.

- (b) Assumindo que g é inversível, $f = h \circ g^{-1}$.