1) a) $8x - 10 > 2x + 8$

$8x - 2x > 8 + 10$

$6x > 18$

$x > \frac{18}{6}$

$x > 3$

b) $2(3x + 7) < -4x + 8$

$6x + 14 < -4x + 8$

$6x + 4x < 8 - 14$

$10x < -6$

$x < \frac{-6}{10}$ (÷2)

$x < \frac{-3}{5}$

c) $20 - (2x + 5) \leq 11 + 8x$

$20 - 2x - 5 \leq 11 + 8x$

$-2x - 8x \leq 11 + 5 - 20$

$-10x \leq -4$.(-1)

$10x \geq 4$

$x \geq \frac{4}{10}$ (÷2)

$x \geq \frac{2}{5}$

2) a) $\frac{2x + 1}{x + 2} > 0$ $\quad f(x) = 2x + 1 > 0$, $2x > -1$, $x > \frac{-1}{2}$ $\quad g(x) = x + 2 > 0$, $x > -2$

$S = \{x \in R \mid -2 < x < -\frac{1}{2}\}$

b) $\frac{2x - 3}{x + 2} \leq 0$ $\quad a(x) = 2x - 3 \leq 0$, $2x \leq 3$, $x \leq \frac{3}{2}$ $\quad b(x) = x + 2 \leq 0$, $x \leq -2$

$S = \{x \in R \mid -2 \leq x \leq \frac{3}{2}\}$

c) $\frac{1}{x-1} < \frac{2}{x-2} \rightarrow \frac{1}{x-1} - \frac{2}{x-2} < 0 \rightarrow \frac{(x-2).1 - (x-1).2}{(x-1).(x-2)} \rightarrow \frac{x - 2 - 2x + 2}{x^2 - 3x + 2} \rightarrow \frac{x}{x^2 - 3x + 2}$

$a(x): x < 0$ $\quad b(x): x^2 - 3x + 2 < 0$

$\Delta = b^2 - 4ac$

$\Delta = (-3)^2 - 4.1.2$

$\Delta = 9 - 8$

$\Delta = 1$

$x = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow x = \frac{3 \pm 1}{2}$ $\quad x' = \frac{3+1}{2} = 2$ $\quad x'' = \frac{3-1}{2} = 1$

$0 < x < 1$, ou $x > 2$

$S = \{x \in R \mid 0 < x < 1, \text{ ou } x > 2\}$

3) $-1 < 2x + 3 < 1$

$-3 - 1 < 2x < 1 - 3$

$-4 < 2x < -2$

$\frac{-4}{2} < x < \frac{-2}{2}$

$-2 < x < -1$

I → $2 - x$, $2 - (-2)$, $2 + 2$, 4

II → $2 - x$, $2 - (-1)$, $2 + 1$, 3

↳ está entre 3 e 4 = (E)

4) $f(x): -x^2 + 2x - 1 < 0$

$\Delta = b^2 - 4ac$

$\Delta = 2^2 - 4.-1.-1$

$\Delta = 4 - 4 = 0$

$\frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow \frac{-2 \pm 0}{-2}$ $\quad x' = \frac{-2+0}{-2} = 1$ $\quad x'' = \frac{-2-0}{-2} = 1$

$x = 1$

5) $\begin{cases} 2x - 4 \leq 4 \longrightarrow I \\ x^2 - 7x + 6 \leq 0 \longrightarrow II \end{cases}$

I. $a(x) = 2x - 4 \leq 4$, $2x \leq 4 + 4$, $2x \leq 8$, $x \leq \frac{8}{2}$, $x \leq 4$

II. $b(x) = x^2 - 7x + 6 \leq 0$

$\Delta = b^2 - 4ac$

$\Delta = (-7)^2 - 4.1.6$

$\Delta = 49 - 24 = 25$

$x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{7 \pm 5}{2}$ $\quad x' = \frac{7+5}{2} = 6$ $\quad x'' = \frac{7-5}{2} = 1$

$S1 = 4$ $\quad S2 = 1$ ou 6

$S1 \cap S2 = \{1, 2, 3, 4\}$

6) preço = P

$P \cdot Q = 480{,}00$

$P - 8$

$Q + 2 = 480{,}00$

$Q = 10$ caixas

$(Q + 2).(P - 8) = 480$

$2P - 8Q + 2P - 16 = 480$

$480 - 8Q + 2P - 16 = 480$

$-8Q + 2P = 16$ (÷2)

$-4Q + P = 8$

$P = 4Q + 8$

$P.Q = 480$

$(4Q + 8).Q = 480$

$4Q^2 + 8Q - 480 = 0$ (÷4)

$Q^2 + 2Q - 120 = 0$

$\Delta = b^2 - 4ac$

$\Delta = 2^2 - 4.1.-120$

$\Delta = 4 + 480$

$\Delta = 484$

$Q = \frac{-b \pm \sqrt{\Delta}}{2a}$

$\frac{-2 \pm 22}{2}$

$Q' = \frac{-2+22}{2} = \frac{20}{2} = 10$

$Q'' = \frac{-2-22}{2} = -12$

7) $2x^2 + kx + 2 = 0$

$\Delta = b^2 - 4ac$

$0 = k^2 - 4.2.2$

$0 = k^2 - 16$

$k^2 = 16$

$k = \pm 4$

8) salário = 1600 + 2% vendas

a) $y = 1600 + 0{,}02x$

b) $4740 = 1600 + 0{,}02x$

$4740 - 1600 = 0{,}02x$

$3140 = 0{,}02x$

$x = \frac{3140}{0{,}02} \rightarrow x = 157.000{,}00$ reais

9) A → 100 + 50 B → 180 + 40

$100 + 50x = 180 + 40x$

$50x - 40x = 180 - 100$

$10x = 80$

$x = \frac{80}{10}$ $x = 8$ consultas

10) $x + \frac{x}{3} = \frac{x}{2} + 30$

$x + \frac{x}{3} - \frac{x}{2} = 30$

$\frac{6x + 2x - 3x}{6} = 30$

$\frac{8x - 3x}{6} = 30$

$\frac{5x}{6} = 30$

$5x = 180$

$x = \frac{180}{5} \rightarrow x = 36$