2.2

③ (a) $\{x \mid -4 \le x \ge -2$, or $-1 < x \ge 4\}$

(b) $\{x \mid -4 \le x \ge 1$, or $3 < x \ge 4\}$

(c) Increasing $-4 \le x \le 1$ and $-1 \le x < 0$

(d) No Concave up. Concave down $-1 < x > 1$

Handout 6

③

$r(s) = \frac{s}{s+6}$

(a) $r(3) = \frac{3}{3+6} = \frac{3}{9} = \boxed{\frac{1}{3}}$

(c) $r(3^{-1}) = r\left(\frac{1}{3}\right) = \frac{\frac{1}{3}}{\frac{1}{3}+6} = \frac{\frac{1}{3}}{\frac{19}{3}} = \boxed{\frac{1}{19}}$

(e) $r(-6) = \frac{-6}{-6+6} = \frac{-6}{0} = \boxed{\text{Undefined}}$

(f) $r(0.6) = \frac{0.6}{0.6+6} = \frac{0.6}{6.6} = \boxed{\frac{1}{11}}$

(h) $r(-t) = \boxed{\frac{-t}{-t+6}}$

(i) $r(t^{-1}) = r\left(\frac{1}{t}\right) = \frac{\frac{1}{t}}{\frac{1}{t}+6} = \frac{\frac{1}{t}}{\frac{1+6t}{t}} = \boxed{\frac{1}{1+6t}}$

(j) $[r(t)]^{-1} = \left(\frac{t}{t+6}\right)^{-1} = \frac{t+6}{t}$

④ $h(x) = 2^x + 1$

a (i) $h(2) = 2^2 + 1 = \boxed{5}$

a (ii) $h(-1) = 2^{-1} + 1 = \boxed{\frac{3}{2}}$

(b) $2h(x) = 2(2^x + 1) = \boxed{4^x + 2}$

(ci) $h(x) = 17 \Rightarrow 17 = 2^x + 1$

$2^x = 16$

$x = 4$

(cii) $2h(x) - 6 = 12 \Rightarrow 12 = 2(2^x + 1) - 6$

$18 = 4^x + 2$

$4^x = 16$

$\boxed{x = 2}$

7 (ai) $f(3) = \boxed{-2}$

(aii) $f(0) = \boxed{1}$

(aiii) $f(-3) = \boxed{0}$

(aiv) $f(2) = \boxed{\text{Undefined}}$

(av) $f(3) - f(-3) = -2 - 0 = \boxed{-2}$

(avi) $f(4) - 2f(3) = -4 - 2(-2) = -4 - -4 = \boxed{0}$

(avii) $2f(-3) - 3 = 2(0) - 3 = \boxed{-3}$

(aviii) $f(0) - f(-3) = 1 - 0 = \boxed{1}$

(aix) $\frac{f(0) - f(-3)}{0 - (-3)} = \frac{1 - 0}{0 - (-3)} = \boxed{\frac{1}{3}}$

(b) $f(x) = 3$ $x = \text{No Solution}$

(c) $f(x) = -3$ $x = 3.5$

8 (ai) $g(0) = -3$

(aii) $g(3) = 7$

(aiii) $g(-7) = \text{Undefined}$

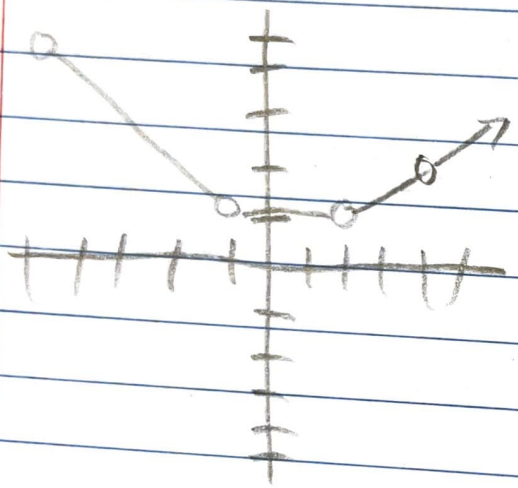
(aiv) $4g(0) = 4(-3) = \boxed{-12}$

(av) $g(-5) - g(0) = 4 - (-3) = \boxed{7}$

(b) $g(t) = 0 \quad t = 1$

(c) $g(t) > 0 \quad t > 3$

(d)



(3) (a) 10 years after 1960 there were C cigarettes consumed by Americans per capita

(b) Not immediatly, but the consumption declined shortly after

(c) Annual Consumption = 4024.5
Daily Consumption = 4024.5/366 = 10.996
(Leap Year)