1. Fill in the blanks below. Assume a and c are fixed constants. (Note that these are all in your text but not in this order.) **Assume** $\lim_{x\to a} f(x)$ **and** $\lim_{x\to a} g(x)$ **exist.**

   (a) $\lim_{x\to a} c =$ ____________________________

   (b) $\lim_{x\to a} x =$ ____________________________

   (c) $\lim_{x\to a} (f(x) + g(x)) =$ ____________________________

      i. What do the rules above imply about $\lim_{x\to 12} (x + \pi)$?

   (d) $\lim_{x\to a} (f(x) - g(x)) =$ ____________________________

   (e) $\lim_{x\to a} cf(x) =$ ____________________________

      i. What do the rules above imply about $\lim_{x\to 5} 2x + 3$?

   (f) $\lim_{x\to a} f(x)g(x) =$ ____________________________

   (g) $\lim_{x\to a} x^n =$ ____________________________

   (h) $\lim_{x\to a} (f(x))^n =$ ____________________________

   (i) $\lim_{x\to a} \frac{f(x)}{g(x)} =$ ____________________________ provided ____________________________

   (j) $\lim_{x\to a} \sqrt[n]{x} =$ ____________________________

   (k) $\lim_{x\to a} \sqrt[n]{f(x)} =$ ____________________________

2. If $\lim_{x\to\sqrt{2}} f(x) = 8$ and $\lim_{x\to\sqrt{2}} g(x) = e^2$, then evaluate

$$\lim_{x\to\sqrt{2}} \left(\frac{g(x)}{(3-f(x))^2} + 2\sqrt{g(x)} \right)$$

3. Use the previous rules to evaluate (a) and explain why you *cannot* use the rules to evaluate (b).

(a) $\displaystyle\lim_{w\to-\frac{1}{2}} \frac{2w+1}{w^3}$

(b) $\displaystyle\lim_{t\to 1} \frac{t^2+t-2}{t^2-1}$

4. (One more super-useful rule!) Fill in the box: If $f(x) = g(x)$ when $x \neq a$, then $\lim_{x\to a} f(x)$ $\boxed{\text{1cm}}$ $\lim_{x\to a} g(x)$ provided the limits exist. Use this rule *and what you know about zeros of polynomials* to evaluate
$\displaystyle\lim_{t\to 1} \frac{t^2+t-2}{t^2-1}$