Answers to WIR 3 Review Problems

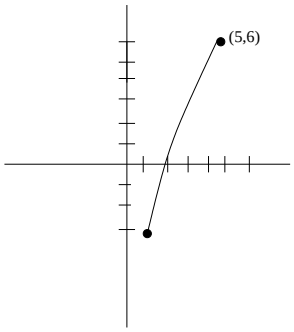
1. Not continuous at $x = -1$ because $\lim_{x \to -1} f(x)$ does not exist, not continuous at $x = 3$ because $x = 3$ is not in the domain, not continuous at $x = 5$ because $\lim_{x \to 5} f(x)$ does not exist,

   not continuous at $x = 7$ because $x = 7$ is not in the domain, continuous at $x = -4$.

2. Not continuous at $x = 1$ because $\lim_{x \to 1} f(x) \neq f(1)$, not continuous at $x = -1$ because $\lim_{x \to -1} f(x)$ does not exist

3. Discontinuous at $x = -3$ and $x = -2$. $\lim_{x \to -2} f(x) = 1$, $\lim_{x \to -3^+} f(x) = \infty$, $\lim_{x \to -3^-} f(x) = -\infty$, thus $\lim_{x \to -3} f(x)$ does not exist.

4. Since $f(1) = -3 < 1$ and $f(5) = 6 > 1$, by the intermediate value theorem and the continuity of f, there must be a value of c, $1 < c < 5$ so that $f(c) = 1$.



5. A solution to the equation exists on $(-2, -1)$ by the Intermediate Value Theorem.

6. A solution to the equation exists on $(-1, 0)$ by the Intermediate Value Theorem.

7. $c = 2$, $d = 0$

8. a.) $-\infty$

   b.) 0

   c.) 3

   d.) $-\dfrac{1}{7}$

   e.) $-\sqrt{5}$

   f.) $\dfrac{5}{2}$

   g.) $-\dfrac{1}{2}$

9. VA: $x = 1$, $x = -1$; HA: $y = 1$

10. a.) $y - 2 = \dfrac{1}{4}(x - 6)$

    b.) $y = x + 1$

11. a.) -5 m/s

    b.) -6 m/s

12. a.) $\langle 3, 2 \rangle$

    b.) $x = 2 + 3t$, $y = 5 + 2t$

    c.) $y = 5 + 2\dfrac{x - 2}{3}$