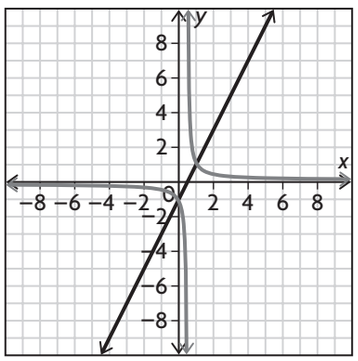
Chapter 5 Review Extra Practice Answers

1. a) i) $D = \{x \in \mathbf{R}\}$, $R = \{y \in \mathbf{R}\}$,
y-intercept $= -1$, x-intercept $= \frac{1}{2}$,
negative on $\left(-\infty, \frac{1}{2}\right)$, positive on $\left(\frac{1}{2}, \infty\right)$,
increasing on $(-\infty, \infty)$

ii) $y = \dfrac{1}{2x - 1}$

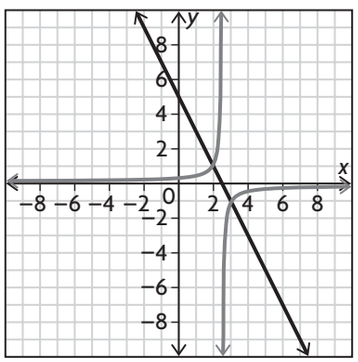
iii)



b) i) $D = \{x \in \mathbf{R}\}$, $R = \{y \in \mathbf{R}\}$,
y-intercept $= 5$, x-intercept $= \frac{5}{2}$,
negative on $\left(\frac{5}{2}, \infty\right)$, positive on $\left(-\infty, \frac{5}{2}\right)$,
decreasing on $(-\infty, \infty)$

ii) $y = \dfrac{1}{5 - 2x}$

iii)



2. a) zero: 2; vertical asymptote: $x = 2$

b) zero: $-\frac{5}{4}$; vertical asymptote: $x = -\frac{5}{4}$

c) zeros: $\sqrt{3}$, $-\sqrt{3}$; vertical asymptotes $x = \sqrt{3}$, $x = -\sqrt{3}$

d) no real zeros, no vertical asymptotes

e) zeros: $\frac{4}{3}$, -6; vertical asymptotes $x = \frac{4}{3}$, $x = -6$

3. a) $x = -\dfrac{8}{3}$

b) none

c) $x = 2$

d) $x = \dfrac{9}{2}$

4. a) $y = 0$

b) none

c) $y = -5$

d) $y = \dfrac{9}{2}$

5. a) $x = 3$

b) $x = 67$

c) $x = 2$

d) $x = 0.30$, $x = -1.13$

e) $x = -\dfrac{2}{11}$

6. no solutions; When solving, after division you get $4 = 0$ which is never true. Therefore, there are no solutions.

7. a) $\{x \in \mathbf{R} \mid -\infty < x < 0 \text{ or } 0 < x < \infty\}$

b) $\{x \in \mathbf{R} \mid x < -\sqrt{5} \text{ or } -\sqrt{5} < x < \infty\}$

c) $\{x \in \mathbf{R} \mid -20 < x < -10 \text{ or } x > -10\}$

8. a) $m = -\dfrac{3}{10}$; $x = 20$

b) $m = -\dfrac{1}{4}$; $x = -6$

c) $m = 2$; $x = -\dfrac{4}{3}$

9. a) Yes at $x = -4$, no at $x = 4$. The function is defined at $x = -4$. However, the function is not defined at $x = 4$. Therefore, you cannot determine the instantaneous rate of change at that point.

b) Yes, the function is defined for $x = 4.000\,001$. The instantaneous rate of change exists at $x = 4.000\,001$, but it is very small or large, because the point is approaching a vertical asymptote.