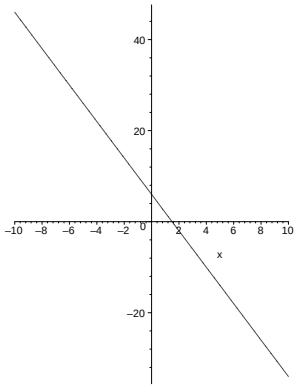
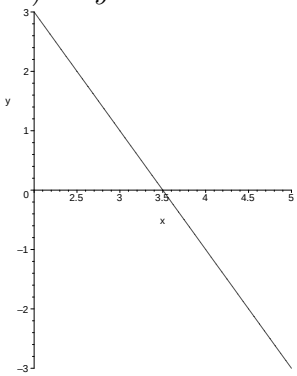
Answers to WIR 2 Review Problems

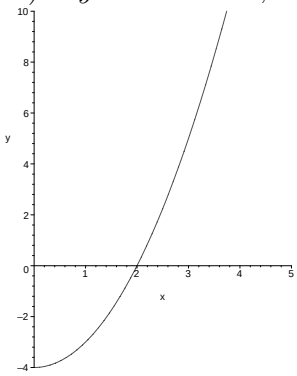
1. a.) $y = 6 - 4x$, D: all reals, R: all reals



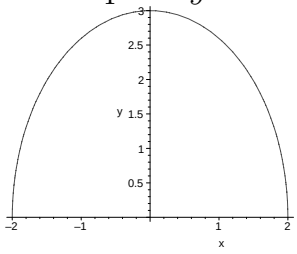
b.) $y = 7 - 2x$, D: $[2, 5]$, R: $[-3, 3]$



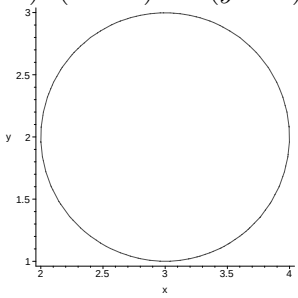
c.) $y = x^2 - 4$, D: $x \geq 0$, R: $[-4, \infty)$



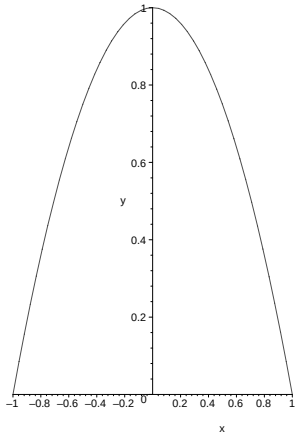
d.) $\dfrac{x^2}{4} + \dfrac{y^2}{9} = 1$, D: $[-2, 2]$, R: $[0, 3]$



e.) $(x-3)^2 + (y-2)^2 = 1$, D: $[2, 4]$, R: $[1, 3]$



f.) $y = 1 - x^2$, D: $[-1, 1]$, R: $[0, 1]$



2. a.) The object is located at the point $(6, 8)$
   b.) $t = 3$
   c.) No
   d.) $y = x^2 - 6x + 8$

3. $x = -3t$, $y = 3 + 2t$ Answer not unique.

4. The lines intersect at the point $\left(\dfrac{2}{5}, \dfrac{36}{5}\right)$

5. $x = 1 - 4t$, $y = 5 + t$. Answer not unique.

6. a) 4
   b) 3
   c) Does not exist
   d) 2
   e.) ∞
   f.) 7

7. ∞

8. $x = -1$ is a vertical asymptote; $\lim_{x\to -1^-} f(x) = -\infty$; $\lim_{x\to -1^+} f(x) = \infty$. Note: there is an open hole in the graph of $f(x)$ at the point $(7, \frac{1}{8})$

9. -1

10. $-\frac{1}{3}$

11. $\frac{2}{\sqrt{3}}$

12. $-\frac{1}{9}$

13. The limit does not exist because $\lim_{x\to 2^+} f(x) = -\infty$ while $\lim_{x\to 2^-} f(x) = \infty$

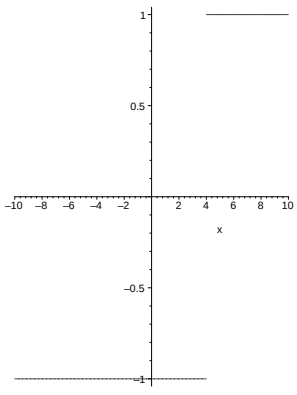
14. $\frac{1}{2}$

15. The limit does not exist because $\lim_{x\to 3^+} f(x) = 17$ while $\lim_{x\to 3^-} f(x) = 5$

16. The limit does not exist because $\lim_{x\to 2^+} f(x) = 1.5$ while $\lim_{x\to 2^-} f(x) = -1.5$

17. $-\infty$

18. Note there is an open circle at the point $(4, 1)$ and $(4, -1)$. The limit does not exist at $x = 4$ because $\lim_{x\to 4^+} f(x) = 1$ while $\lim_{x\to 4^-} f(x) = -1$



19. 4

20. 0