Problem 1. Section 2.2 #32

Make a table showing the values of f for $x = 0.01$, 0.001, 0.0001, 0.00001 and for $x = 0.01$, 0.001, 0.0001, 0.00001. Round your solutions to five decimal places.

x	$f(x)$	x	$f(x)$
-0.01	2.73199	0.01	2.70481
-0.001	2.71964	0.001	2.71692
-0.0001	2.71842	0.0001	2.71815
-0.00001	2.7183	0.00001	2.71827

Problem 2. Section 2.2 #34

To which mathematical constant does the limit in the preceding exercise appear to be getting closer?

Euler's number, e.

Problem 3. Section 2.2 #38

Set up a table of values to find the indicated limit. Round to eight digits. For $\lim_{x\to 2} \frac{x^2-4}{x^2+x-6}$

x	$f(x)$	x	$f(x)$
1.9	0.795918	2.1	0.803922
1.99	0.799599	2.01	0.800399
1.999	0.79996	2.001	0.80004
1.9999	0.799996	2.0001	0.800004

The limit is 0.8.

Problem 4. Section 2.2 #46

This statement is true; $\lim_{x\to 10} f(x) = 0$.

Problem 5. Section 2.2 #48

This statement is false; $f(-8) = -3$, while $\lim_{x\to -8} f(x) = -6$.

Problem 6. Section 2.2 #60

$\lim_{x\to -2^+} f(x) = 2$

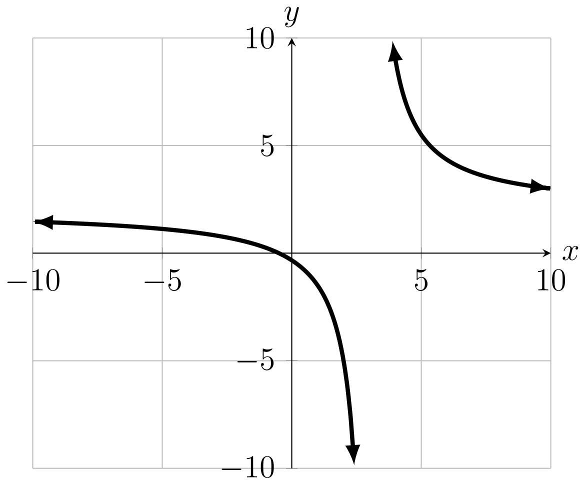
Problem 7. Section 2.2 #62

$\lim_{x\to 2^-} f(x) = -2$

Problem 8. Section 2.2 #64

This limit does not exist. We have $\lim_{x\to 2^-} f(x) = -2$ but $\lim_{x\to 2^+} f(x) = 2$.

Problem 9. Section 2.2 #78



Problem 10. Section 2.2 #82

A track coach uses a camera with a fast shutter to estimate the position of a runner with respect to time. A table of the values of position of the athlete versus time is given here, where x is the position in meters of the runner and t is time in seconds. What is $\lim_{t\to 2} x(t)$? What does it mean physically?

t (sec)	x (m)
1.75	4.5
1.95	6.1
1.99	6.42
2.01	6.58
2.05	6.9
2.25	8.5

We can approximate $\lim_{t\to 2} x(t) = 6.5$. This means at time 2 seconds, the runner has advanced 6.5 meters.