1.1.1. Find $\frac{1}{3} - \frac{2}{7} + 1$. Leave your answer in exact form and simplify your answer.

Answer: $\frac{22}{21}$

1.1.2. Find $\sqrt{50} + \sqrt{72}$. Leave your answer in exact form and simplify your answer.

Answer: $11\sqrt{2}$

1.1.3. Simplify the expression $\frac{1}{x^2 + 7x + 12} + \frac{1}{x + 4} + \frac{1}{x + 3}$.

Answer: $\frac{2}{x + 3}$

1.1.4. Find all values of $x$ such that $x^2 + 7x + 1 = 0$. Leave your answer in exact form.

Answer: $x = -\frac{7}{2} + \frac{3\sqrt{5}}{2}$ and $x = -\frac{7}{2} - \frac{3\sqrt{5}}{2}$

1.1.5. Find all values of $x$ such that $(x + 2)^2 = x^2 - 2(x - 8)$.

Answer: $x = 2$

1.1.6. Find all values of $x$ such that $1 + 9 \log(x - 3) = 19$.

Answer: $x = 103$

1.1.7. Let $f(x) = x^2 - 4x - 11$. Find all values of $t$ such that $f(t) = 10$.

Answer: $t = -3$ and $t = 7$

1.1.8. Find the equation of a line with slope $\frac{3}{2}$ which goes through the point $(2, -1)$.

Answer: $y = \frac{3}{2}x - 4$

1.1.9. What is the largest possible domain of the function $g(x) = \frac{x + 3}{x^2 + 3x + 2}$? Write your answer in interval notation.

Answer: $(-\infty, -2) \cup (-2, -1) \cup (-1, \infty)$

1.1.10. Find the $x$-intercepts and $y$-intercepts of the function $f(x) = x^2 - 3x - 10$.

Answer: The $x$-intercepts are $(5, 0)$ and $(-2, 0)$. The $y$-intercept is $(0, -10)$.

1.1.11. Let $f(x) = \frac{1}{2}e^x - 3$.

(a) Find $f(3)$. Round your answer to two decimal places.

Answer: 7.04

(b) Find a value $x$ such that $f(x) = 2$. Round your answer to two decimal places.

Answer: 2.3

(c) Graph $y = f(x)$. Label the $y$-intercept and $f(3)$.

Answer: On graph below

1.1.12. A software manufacturer is developing a particular computer game. They are doing market research to determine at which price they should sell this game. They find that if they sell the game for $x$ dollars each then their expected profit per month from this game’s sales is $P(x) = -10x^2 + 700x - 2250$ dollars.

(a) At what price should they sell the game to maximize their profit?

Answer: $35$

(b) What is the maximum profit they can make in a month from the sale of this game?

Answer: $10,000$

1.1.13. Three consecutive positive integers are such that twice the smallest integer minus the largest integer plus the square of the middle integer is 153. What are the three integers?

Answer: $11, 12, \text{ and } 13$

1.1.14. The graph of $f(x)$ is drawn below. Draw the graph of $g(x) = \frac{1}{2}f(x + 3) - 4$ on the same plot. (Assume that the scale on the axes is in increments of one.)
\[ y = f(x) \]
\[ y = g(x) \]