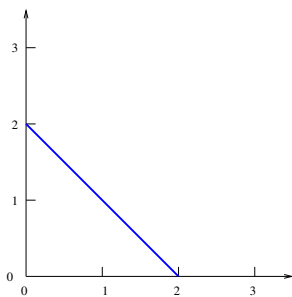


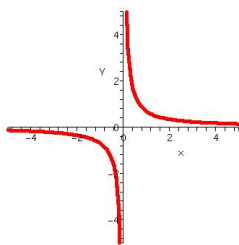
Math 251
Answers for Practice Test 1b

1. See textbook page 587, Example 11.
2. 1.
3. $16/\sqrt{14} = \frac{8\sqrt{14}}{7} \approx 4.276$.
4. a. For $y = 0$ we get $4x^2 + 12z^2 = -12$. But the left hand side is never negative. Thus, the graph is empty.
b. A two sheeted hyperboloid.
5. Since $x + y = 2$ the graph is this line, but $x(t)$ and $y(t)$ are restricted to be in $[0,2]$.



6. $\int_0^{10} \sqrt{t^2 + t^4/4 + e^{2t} - 2e^t + 1} dt.$

7. For $z = 0$ the graph is empty. For $z = 1$ the graph is the x and y axes since we have $xy = \ln 1 = 0$. For $z = 2$ we get the hyperbola shown below.



8. Let $\mathbf{v} = \langle 7, 2, 1 \rangle - \langle 1, -2, 3 \rangle = \langle 6, 4, -2 \rangle$ and $\mathbf{r}_0 = \langle 7, 2, 1 \rangle$. Then use

$$\mathbf{r}(t) = \mathbf{v}t + \mathbf{r}_0 = \langle 6t + 7, 4t + 2, -2t + 1 \rangle.$$

Other valid answers exist.

9. Let $x(t) = 4 \cos t$ and $y = 4 \sin t$. Then set $z(t) = 5 - x(t) = 5 - 4 \cos t$. Thus we have

$$\mathbf{r}(t) = \langle 4 \cos t, 4 \sin t, 5 - 4 \cos t \rangle.$$

Other valid answers exist.

10. $\sqrt{14}$