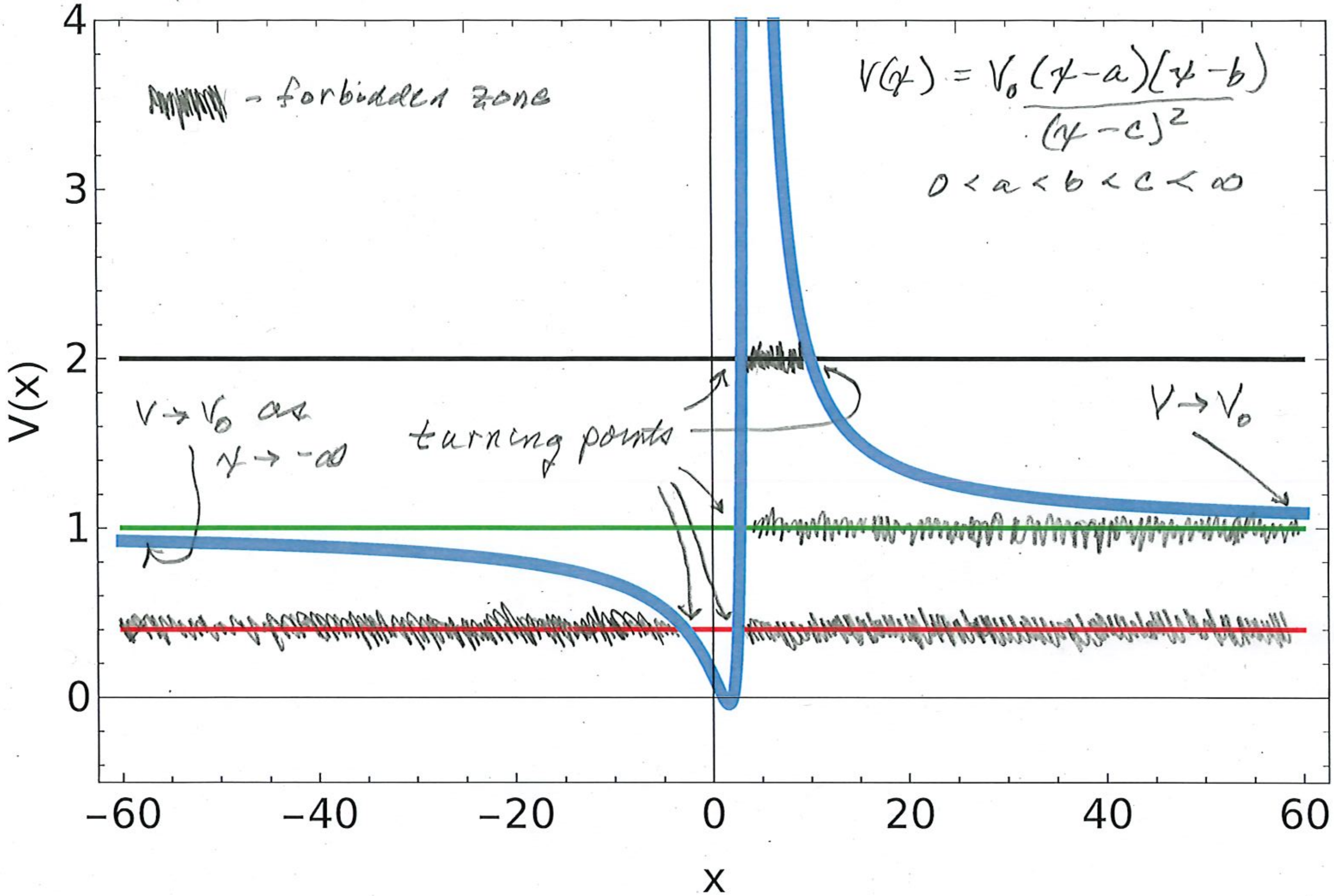
a.



b. See labels on plot. For $x = -\infty$ and $E > V_0$, the particle moves at a constant speed and never reflects (no turning point). For $x = -\infty$ and $E < V_0$ it eventually reaches a turning point.

$$E = \frac{3V_0}{a-b}\left(b - 4a + 3c\right) = V_0\frac{(x-a)(x-b)}{(x-c)^2}$$

at the turning point

$E = V$

$$\frac{3V_0}{c-b}(b - 4a + 3c) = V_0 \frac{(x-a)(x-b)}{(x-c)^2}$$

$$\frac{3(b-4a+3c)}{c-b} = \frac{x^2 - bx - ax + ab}{x^2 - 2cx + c^2}$$

$$3(x^2 - 2cx + c^2)(b - 4a + 3c) =$$
$$x^2(c-b) - (b+a)(c-b)x + ab(c-b)$$

$$3bx^2 - 12ax^2 + 9cx^2 - 6cbx + 24cax$$
$$- 18c^2x + 3c^2b - 12ac^2 + 9c^3 =$$
$$x^2(c-b) - (bc - b^2 + ac - ab)x +$$
$$abc - ab^2$$

$$x^2(3b - 12a + 9c - (c-b)) +$$
$$x(-6cb + 24ac - 18c^2 + bc - b^2 + ac - ab) +$$
$$3c^2b - 12ac^2 + 9c^3 - abc + ab^2 = 0$$

$$x^2(4b - 12a + 8c) +$$
$$x(-5bc + 25ac - 18c^2 - b^2 - ab) +$$
$$3bc^2 - 12ac^2 + 9c^3 - abc + ab^2 = 0$$

Eeep! Use Mathematica

```
Solve[
 (4*b1 - 12*a1 + 8*c1)*x^2 + (-5*b1*c1 + 25*a1*c1 - 18*c1^2 - b1^2 - a1*b1)*x +
   (3*b1*c1^2 - 12*a1*c1^2 + 9*c1^3 - a1*b1*c1 + a1*b1^2) == 0, x]
```

$$\left\{\left\{x \to \frac{1}{4}(b1 + 3\,c1)\right\}, \left\{x \to \frac{-a1\,b1 + 4\,a1\,c1 - 3\,c1^2}{3\,a1 - b1 - 2\,c1}\right\}\right\}$$