① a) There would be no output if the script was run as is.

b) a = 1
a = 1 4
a = 1 4 9

c) a = 1 4 9

d) something = 9

you don't need to know what this is, but it would be "ans"

② This is happening because another version of a had been previously computed. It can be fixed by adding clear all to the top of the script.

③ a = 1 2 6 4 5

④ $[a_2,b_2]=[0,1.5]$, $[a_3,b_3]=[0.75,1.5]$, $[a_4,b_4]=[1.125,1.5]$, $[a_5,b_5]=[1.125,1.3125]$

⑤ a) $(x_{n-1}, f(x_{n-1}))$ b) slope $= f'(x_{n-1})$ c) slope $= \frac{f(x_{n-1})-0}{x_{n-1}-x_n} = \frac{0-f(x_{n-1})}{x_n-x_{n-1}}$

d) $f'(x_{n-1}) = \frac{0-f(x_{n-1})}{x_n-x_{n-1}}$

$$(x_n - x_{n-1}) f'(x_{n-1}) = -f(x_{n-1})$$

$$x_n - x_{n-1} = \frac{-f(x_{n-1})}{f'(x_{n-1})}$$

$$x_n = x_{n-1} - \frac{f(x_{n-1})}{f'(x_{n-1})}$$

⑥ a) abs(a(k)-b(k))>0.001 or (not in the stopping condition – another possible answer) b(k)-a(k)>0.001

b)
```
if f(m)*f(b(k))<0
    a(k+1) = m;
    b(k+1) = b(k);
else
    a(k+1) = a(k);
    b(k+1) = m;
end
```

c)
```
while ...
    k=k+1
    m = (a(k-1)+b(k-1)/2;
    if f(m)*f(b(k-1))<0
        a(k) = m;
        b(k) = b(k-1);
    else
        a(k) = a(k-1);
        b(k) = m;
    end
end
```

(7) a) The script will not stop if we run it as it is, because it will keep computing a(2) over and over.

b) Add k=k+1 after a(k+1)=2*a(k) to fix the problem.

(8) $m = \frac{0+2}{2} = 1$

$f(a_1) = -1 \quad (f(x) = \sin x - e^{-x})$

$f(m) = 0.47$

$f(a_1)f(m) < 0$, so

$[a_2, b_2] = [0, 1]$

$m = \frac{0+1}{2} = 0.5$

$f(a_2) = -1$

$f(m) = -0.12$

$f(a_2)f(m) > 0$, so

$[a_3, b_3] = [0.5, 1]$

(9) $f(x) = \sin x - e^{-x}$

$f'(x) = \cos x + e^{-x}$

$x_2 = x_1 - \frac{f(x_1)}{f'(x_1)}$

$= 0 - \frac{-e^0}{\cos 0 + e^0} = \frac{1}{2} = 0.5$

$x_3 = x_2 - \frac{f(x_2)}{f'(x_2)}$

$= 0.5 - \frac{\sin 0.5 - e^{-0.5}}{\cos .5 + e^{-0.5}}$

$= 0.5 - \frac{-0.1271}{1.4841}$

$= 0.5856$