1) The first step would be to assume that the given statement is true; to assume that there is no largest prime number.

2) Because if the antivirus output is “yes”, then nothing would happen, meaning Antivirus is outputting the wrong result. If the output is “no”, then Evil will do something malicious, which also means that Antivirus came up with the incorrect answer.

3)

1. Algorithm B is non-polynomial.
2. The polynomial algorithm is considered more doable because it scales up in a more reasonable way. Algorithm B is exponential, and the time it takes to calculate something will quickly grow out of control for larger values of *n*.

4) 50 qubits should be able to check 2^50 = 1,125,899,906,842,624 states.

5)

1. RSA leans on the fact that prime number factorization is computationally expensive.
2. An ideal quantum computer should be much more efficient at factoring primes.

6)

|  |
| --- |
| *var myArray= [];*  *for (var i = 0; i < 10; i++) {*  *appendItem(myArray, randomNumber(1,10));*  *}*  *for (var i = 0; i < myArray.length; i++)*  *{*  *myArray[i] \*= myArray[i];*  *}* |

7)

|  |
| --- |
| *var testArray = [];*  *for (var i = 0; i < 10; i++) {*  *appendItem(testArray, randomNumber(0,10));*  *}*  *var containsValuesLessThanThree = false;*  *for (var i = 0; i < testArray.length; i++) {*  *if (testArray[i]<3)*  *{*  *containsValuesLessThanThree = true;*  *}*  *}*  *console.log("Array contains any values less than 3: "+containsValuesLessThanThree);* |

8)

|  |
| --- |
| *// Variables*  *var eventList = [];*  *var brushSize = 10;*  *var sprayPaintVariance = 3;*  *var sprayDotsPerCircle = 3;*  *// Canvas Setup*  *setActiveCanvas("canvas\_main");*  *setStrokeColor(rgb(0,0,0,0));*  *setFillColor(rgb(0,0,0,0.5));*  *// Draw Normally*  *onEvent("canvas\_main", "mousemove", function(event) {*  *if (event.shiftKey)*  *{*  *circle(event.offsetX, event.offsetY, brushSize);*  *appendItem(eventList,event);*  *}*  *});*  *// Clear Canvas*  *onEvent("button\_clearCanvas", "click", function( ) {*  *console.log("button\_clearCanvas clicked!");*    *clearCanvas();*  *eventList = [];*  *});*  *// Original Canvas*  *onEvent("button\_original", "click", function( ) {*  *console.log("button\_original clicked!");*    *clearCanvas();*    *for (var i = 0; i < eventList.length; i++)*  *{*  *circle(eventList[i].offsetX, eventList[i].offsetY, brushSize);*  *}*  *});*  *// Random Canvas*  *onEvent("button\_random", "click", function( ) {*  *console.log("button\_random clicked!");*    *clearCanvas();*    *for (var i = 0; i < eventList.length; i++)*  *{*  *circle(eventList[i].offsetX, eventList[i].offsetY, randomNumber(2,brushSize\*2));*  *}*  *});*  *// Spray Paint*  *onEvent("button\_sprayPaint", "click", function( ) {*  *console.log("button\_sprayPaint clicked!");*    *clearCanvas();*    *for (var i = 0; i < eventList.length; i++)*  *{*  *for (var j = 0; j < sprayDotsPerCircle; j++)*  *{*  *circle(eventList[i].offsetX+randomNumber(-sprayPaintVariance,sprayPaintVariance), eventList[i].offsetY+randomNumber(-sprayPaintVariance,sprayPaintVariance), 2);*  *}*  *}*  *});* |