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Problem 2

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```
clear all
clc
```

Deterimining the Weights

If our method exactly integrates up to a 2nd degree polynomial, then we know that at $g(x) = 1$, $g(x) = x$, and $g(x) = x^2$ that $\Sigma w_i g_i = \int \frac{g(x)}{\sqrt{1-x^2}}$. Further we are given the final values for the three analytic integrals listed above.

```
analyticIntegrals = [pi; 0; pi/2];
sumFnEvals = [1 1 1; -1 0 1; 1 0 1]; % linear comb of weighted evals
disp(sumFnEvals);
```

```
     1     1     1
    -1     0     1
     1     0     1
```

We can take the inverse of the matrix of function evals to find the weights.

```
weights = sumFnEvals\analyticIntegrals;
disp(weights);
```

```
    0.7854
    1.5708
    0.7854
```

Approximate Integral

Use your method to approximate: $\int_4^9 \frac{sin(x)}{\sqrt{25x-(x+6)^2}} dx$

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