```
> # note that (u^2 - v^2)^2 + (2·u·v)^2 = (u^2 + v^2)^2
> # this works for integers as well as complex numbers
> # choose
> u := 1 + 2·i;
```

$$u := 1 + 2\,i \tag{1}$$

```
> v := 1 + i;
```

$$v := 1 + i \tag{2}$$

```
> a := expand(u^2 - v^2);
```

$$a := 2\,i + 3\,i^2 \tag{3}$$

```
> # note that i^2 = -1.
> a := -3 + 2 i
```

$$a := -3 + 2\,i \tag{4}$$

```
> b := expand(2·u·v);
```

$$b := 2 + 6\,i + 4\,i^2 \tag{5}$$

```
> b := -2 + 6 i
```

$$b := -2 + 6\,i \tag{6}$$

```
> c := expand(u^2 + v^2);
```

$$c := 2 + 6\,i + 5\,i^2 \tag{7}$$

```
> c := -3 + 6 i
```

$$c := -3 + 6\,i \tag{8}$$

```
> #check
> LeftHandSide := expand(a^2 + b^2);
```

$$LeftHandSide := 13 - 36\,i + 40\,i^2 \tag{9}$$

```
> LeftHandSide := -27 - 36·i
```

$$LeftHandSide := -27 - 36\,i \tag{10}$$

```
> RightHandSide := expand(c^2);
```

$$RightHandSide := 9 - 36\,i + 36\,i^2 \tag{11}$$

```
> RightHandSide := -27 + 36 i
```

$$RightHandSide := -27 + 36\,i \tag{12}$$

```
> #Since LeftHandSide equals RightHandSide, we have found a,b, and c in the complex numbers
  # that satisfy the Pythagorean Theorem.
> #Pretty Cool
> # Matt C Anderson 11- 25 - 2020
>
```