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# First Racket Programming Assignment Solution

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### Learning Abstract

In this assignment I learned a little bit about numeric computations in Lisp. I also learned how to bind variables to values. I solved a couple of numeric problems by using basic arithmetic operations. And I learned to use a Racket library to create and display shapes so that I could render the problem situations graphically.

All of this took place within the Interactions pane of the DrRacket PDE.

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### Interaction: Simple Numeric Processing

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```
> 5
5
> 5.3
5.3
> ( * 3 10 )
30
> ( + ( * 3 10 ) 4 )
34
> ( * 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 )
12157665459056928801
> |
```

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### Interaction: Solution to the Scrap Problem

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**The Scrap Problem:** A circular disk of maximal size is cut from a square piece of tin of side 100 units. What is the area of the scrap?

```
> pi
3.141592653589793
> side
.. side: undefined;
cannot reference an identifier before its definition
> ( define side 100 )
> side
100
> ( define square-area ( * side side ) )
> square-area
10000
> ( define radius ( / side 2 ) )
```

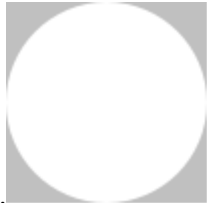
```
> radius
50
> ( define circle-area ( * pi radius radius ) ) > circle-area
7853.981633974483
> ( define scrap-area ( - square-area circle-area ) )
> scrap-area
2146.018366025517
```

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### Interaction: Illustration of Scrap Problem Situation

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```
> (require 2htdp/image)
> ( define side 100 )
> ( define the-square ( square side "solid" "silver" ) )
> the-square
.
> ( define radius ( / side 2 ) )
> ( define the-circle ( circle radius "solid" "white" ) )
> ( define the-image ( overlay the-circle the-square ) )
> the-image
```

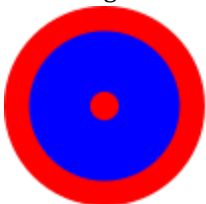


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### Interaction: Illustration of the Target Problem Situation

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```
> ( define red-disk ( circle radius "solid" "red" ) )
> ( define blue-disk ( circle ( * radius 0.75 ) "solid" "blue" ) )
> ( define red-disk2 ( circle ( / radius 7 ) "solid" "red" ) )
> ( define the-target ( overlay red-disk2 blue-disk red-disk ) )
> the-target
```



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## Interaction: Solution to Target Problem

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```
> ( define the-percentage ( / ( + ( * radius radius ) ( * ( * 0.75 radius ) ( * 0.75 radius ) ) ) ) ( * ( / radius 7 ) ( / radius 7 ) ) ) ( * radius radius ) )
```

```
> the-percentage
```

```
0.45790816326530615
```