First load plots and student:

```maple
> with( student): with (plots):
```

Section 1.1 Problem 58 p.12

58. DISTRIBUTION COST Suppose that the number of worker-hours to distribute new telephone books to x% of the households in a certain community is given by the function 

$$f(x) = \frac{600x}{300-x}.$$ 

```maple
> disthours := proc(x)
> (600*x)/(300-x):
> end proc;
> 
> fdisthours := proc(x) 600 * x / (300 - x) end proc
```

Try to plot

```maple
> plot(disthours(x), x=0..300, thickness=3, labels=[\`x = percent distributed`, \`y = hours\]);
```

![Graph](image-url)
Note the size of the units on the y axis. The graph does not tell us much because of the singularity at x = 300. But the "practical interest" is the percentage x between 0 and 100

\[ \text{plot} (\text{fdisthours}(x), \ x=0..100, \text{thickness}=3, \text{labels}=[\text{`x = percent distributed`}, \text{`y = hours`}]); \]

The domain of the function fdistcost is "all x not equal 300."
Practical interpretation is valid for 0 <= x <= 100.
The books are distributed to 50% of the community when x=50
\[ \text{fdisthours}(50); \]
and the number of hours is

\[ 120 \]  \hspace{1cm} (2) \]

The entire community is served when x=100:
\[ \text{fdisthours}(100); \]
\[ 300 \]  \hspace{1cm} (3) \]

When 150 hours have been completed we have distributed to x % where fdisthour(x) = 50:
\[ \text{solve}(\text{fdisthours}(x)=150,x); \]
\[ 60 \]  \hspace{1cm} (4) \]
Solve the equation \( \frac{600\times}{300-x} = 150 \).

\[ eqn := \frac{600 \times}{300-x} = 150 \]  
(5)

\[ eqn := \frac{600 \times}{300-x} = 150 \]  
(5)

\[ \text{simplify(eqn);} \]  
(6)

\[ \frac{600 \times}{-300 + x} = 150 \]  
(6)

\[ \text{solve}(600\times = 150*(300 - x), x); \]  
(7)

\[ 60 \]  
(7)