Sample input points (T(n) vs. n):

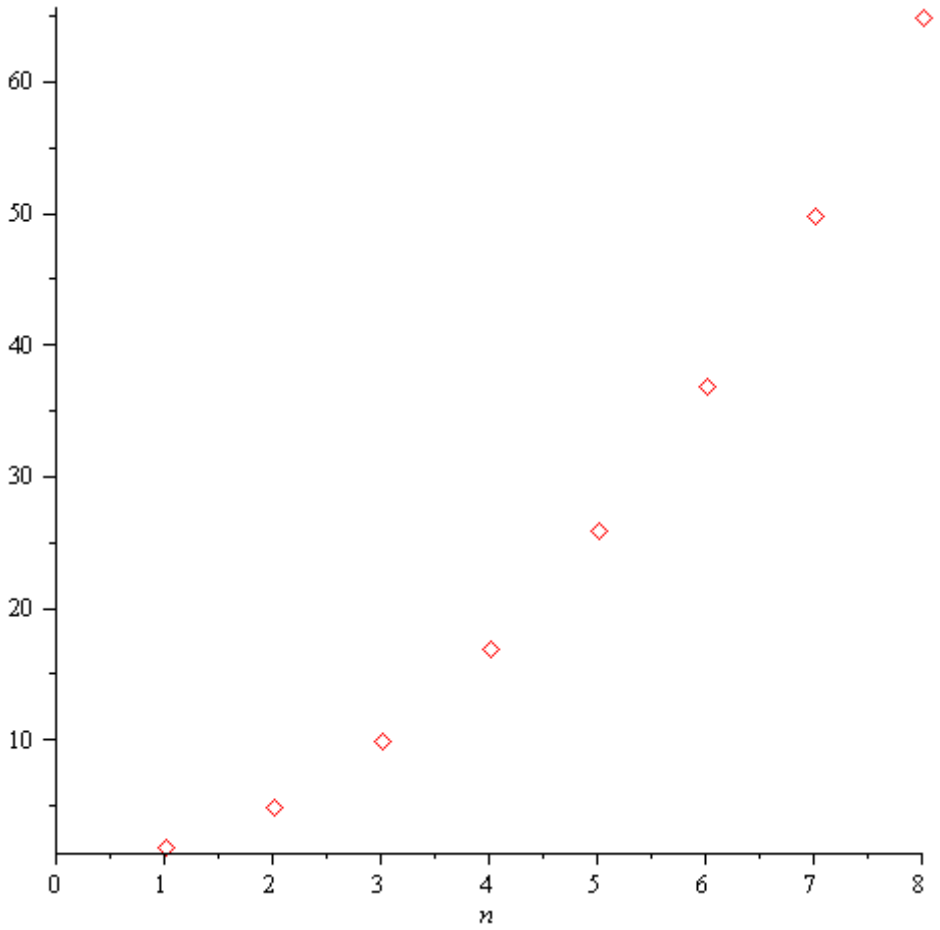
```
> input := [[1,2],[2,5],[3,10],[4,17],[5,26],[6,37],[7,50],[8,65]];
```

$$input := [[1, 2], [2, 5], [3, 10], [4, 17], [5, 26], [6, 37], [7, 50], [8, 65]] \quad (1)$$

```
> with( plots ):
```

Let's look at T(n) vs. n:

```
> plot( input, n=0..8, style=point, symbolsize=15 );
```



Increasing. So, ω(1) (bound below by constant, not tightly). Let's consider T(n)/n vs. n

I'll provide a procedure that can be passed to map. Given a point [x,y] and a function, e.g., n->n^2, returns the point [x, y/func(x)]

```
> applyPoint := proc( point, func )  local x, y;
   description "Divides y by func(x)";
   x := point[1]; y := point[2];
   [ x, y/func(x) ];
  end proc:
```

Here is another function, for your convenience. Takes a list of points and a function, returns a list of points, [x, y/func(x)]

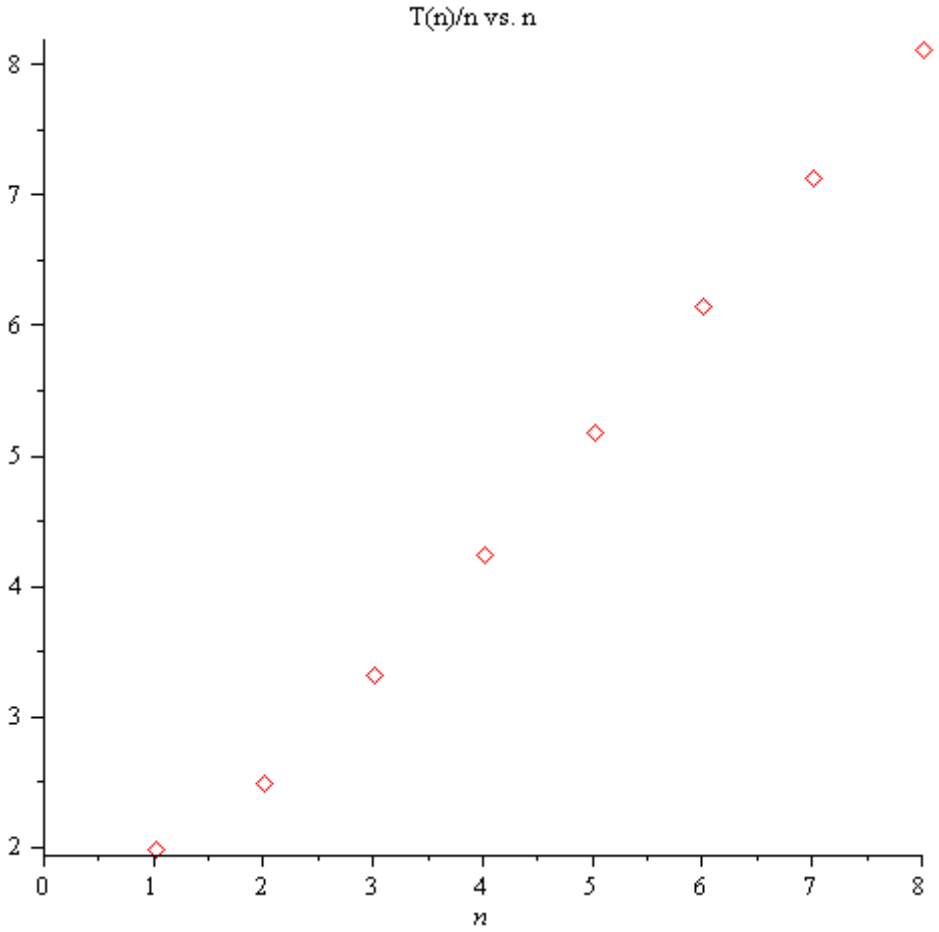
```
> pointMapFamily := proc( points, func )
   description "plotPoints( points, func ) plots points (x, func(y))";
   map( applyPoint, points, func)
  end proc:
```

Take another stab at the data above. Divide by n:

```
> guess_n := pointMapFamily( input, n->n );
```

$$guess\_n := \left[[1, 2], \left[2, \frac{5}{2}\right], \left[3, \frac{10}{3}\right], \left[4, \frac{17}{4}\right], \left[5, \frac{26}{5}\right], \left[6, \frac{37}{6}\right], \left[7, \frac{50}{7}\right], \left[8, \frac{65}{8}\right] \right] \quad (2)$$

```
> plot( guess_n, n=0..8, style=point, symbolsize=15 );
```



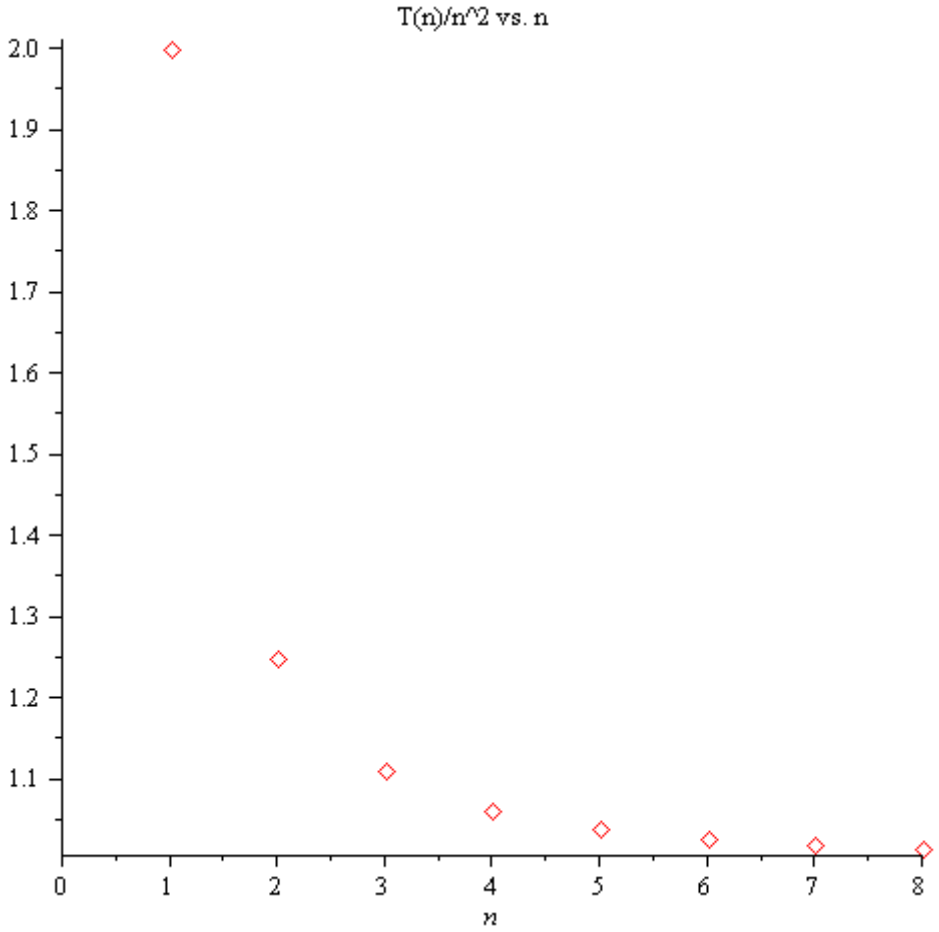
Nope, still increasing. ***So, T(n) = ω(n) (T(n) is bound below by a line, but not tightly)***

Try T(n) / n^2:

```
> guess_n_2 := pointMapFamily( input, n->n^2 );
```

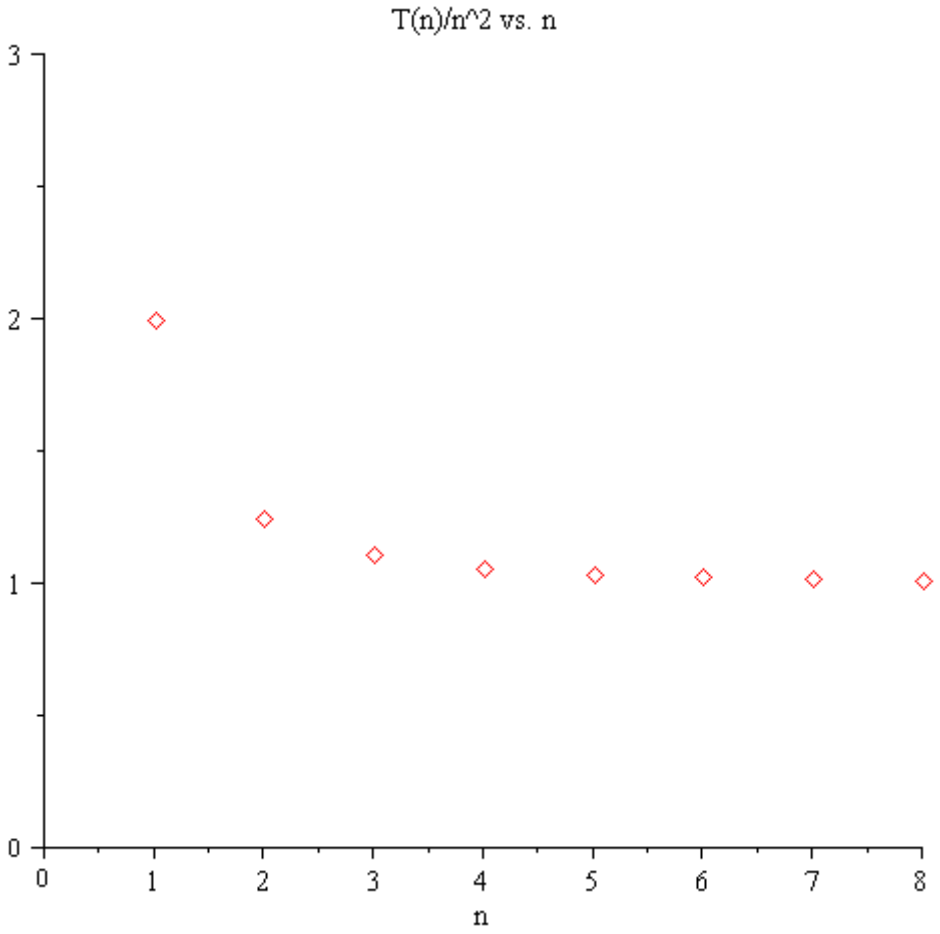
$$guess\_n\_2 := \left[[1, 2], \left[2, \frac{5}{4}\right], \left[3, \frac{10}{9}\right], \left[4, \frac{17}{16}\right], \left[5, \frac{26}{25}\right], \left[6, \frac{37}{36}\right], \left[7, \frac{50}{49}\right], \left[8, \frac{65}{64}\right]\right] \quad (3)$$

```
> plot( guess_n_2, n=0..8, style=point, symbolsize=15 );
```



Shoot, going to 0. Or is it? Look more closely:

```
> plot( guess, n=0..8, 0..3, style=point, symbolsize=15 );
```



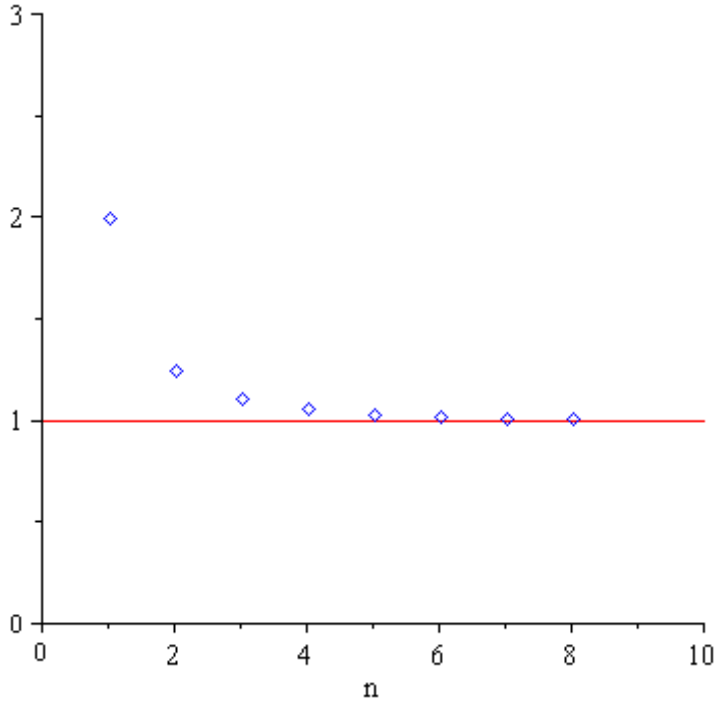
How 'bout that? ***Looks as if T(n) =*** $\Theta(n^2)$

Let's look at this with the line y=1

```
> ourPoints := plot( guess, n=0..8, 0..3, style=point, symbolsize=15, color=blue ):

> asym := plot( 1, n=0..10 ):

> display( { ourPoints, asym } );
```


3
2
1
0
0
2
4
6
8
10
n