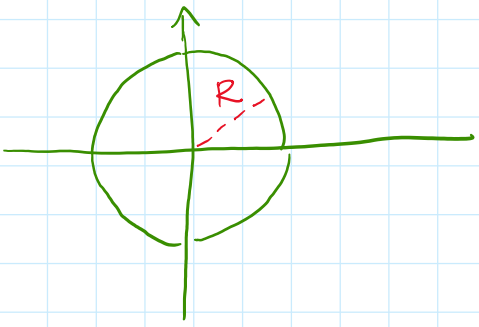
p 073 q7

**7. a)** Express the radius of a circle as a function of its area.

**b)** Create a table of values and a graph to illustrate the relationship that this radical function represents.




$A = \pi R^2$ = the area of the circle

a) To say something equals a function of the area is the same as saying $= f(A)$

what we want is a formula tha looks eike so:

that is.... $R = f(A)$

on one side there should be R but nowhere else

on the right side we should have an expression - whatever it may be - that is using A but not R

(*) (**) $A = \pi R^2$

this is what we know, but this does not fulfill the requirement stated in (*) so we'll have to rearrange

To have R on the ~~left~~ as required we should isolate R from (**)

First swap the two sides

$$R^2\pi = A$$

Divide both sides by $\pi$

$$R^2 = \frac{A}{\pi}$$

We isolated $R^2$ but we actually need to isolate R.

$$R = \pm\sqrt{\frac{A}{\pi}}$$

However, we know the radius is a geom. dist, so for this particular example, the radius cannot be negative.

$\therefore R \geq 0 \Rightarrow R = \sqrt{\frac{A}{\pi}}$ ***

↓ this is our "$f(A)$"

b) to create a table of values, let's say a few examples of A-s: $0, 1, \pi, 4\pi, \ldots$ & calculate R

| A | $R = \sqrt{\frac{A}{\pi}}$ *** | (A, R) | name my points |
|---|---|---|---|
| 0 | $\sqrt{\frac{0}{\pi}} = 0$ | (0, 0) | P |
| 1 | $\sqrt{\frac{1}{\pi}} = \sqrt{\frac{1}{3.14}} = 0.5641$ | (1, 0.5641) | R |

| | | | |
|---|---|---|---|
| 1 | $\sqrt{\frac{1}{\pi}} = \sqrt{\frac{1}{3.14}} = 0.5641$ | $(1, 0.5641)$ | K |
| $\pi$ | $\sqrt{\frac{\pi}{\pi}} = \sqrt{1} = 1$ | $(\pi, 1)$ | Q |
| $4\pi$ | $\sqrt{\frac{4\pi}{\pi}} = \sqrt{4} = 2$ | $(4\pi, 2)$ | M |

I have used Desmos to plot these points

https://www.desmos.com/calculator/rhxaedugas

$$R(A) = \sqrt{\frac{A}{\pi}}$$

| $x_1$ | $R(x_1)$ |
|---|---|
| 0 | 0 |
| 1 | 0.56418958 |
| $\pi$ | 1 |
| $4\pi$ | 2 |

