Parallel Parking

How to Perfectly Parallel Park

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What is the minimum space needed to Parallel Park?

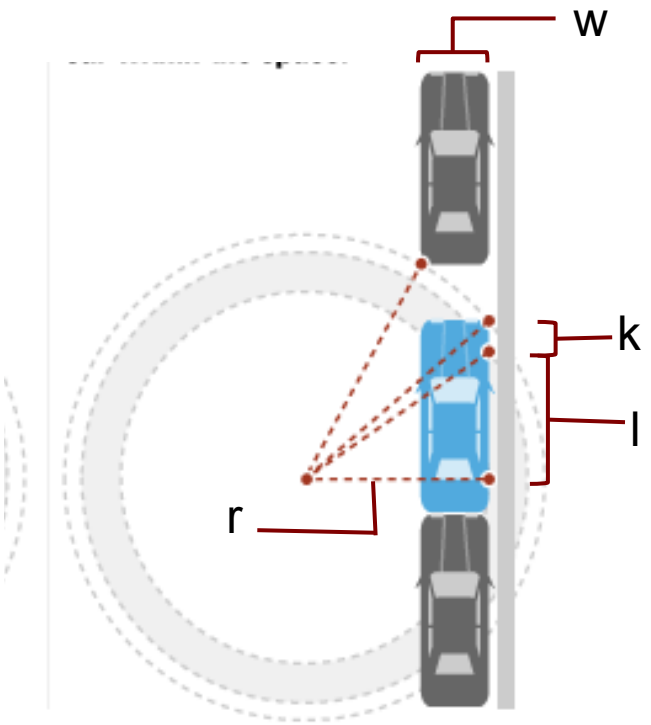
Variables

r= turning radius

l= wheel base

k= distance from front wheel to front bumper

w=width of car in front



Formula

Minimum Space Required=

length of your car +

$$\sqrt{(r^2-l^2)}+(l+k)^2-(\sqrt{r^2-l^2}-w)^2 -l-k$$

r= turning radius

l= wheel base

k= distance from front wheel to front bumper

w=width of car in front

Deriving the Formula

Pythagorean Theorem:

$\triangle EFX \rightarrow FX=$

$r^2+l^2=FX^2$

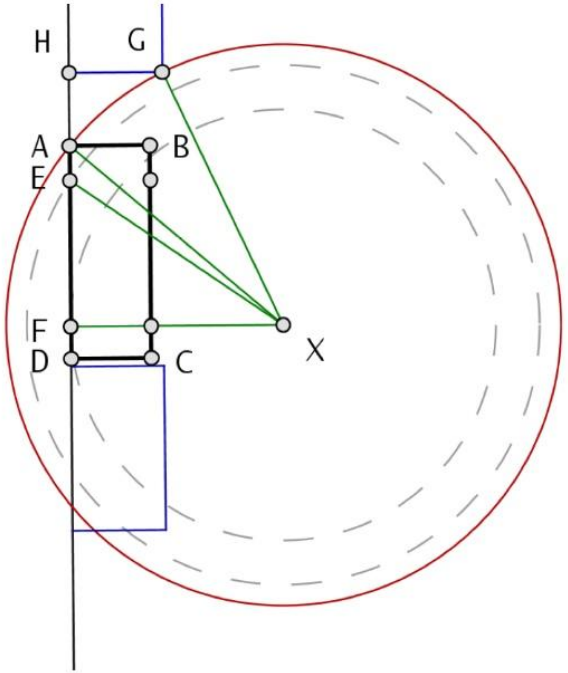
$FX=\sqrt{r^2-l^2}$

Pythagorean Theorem:

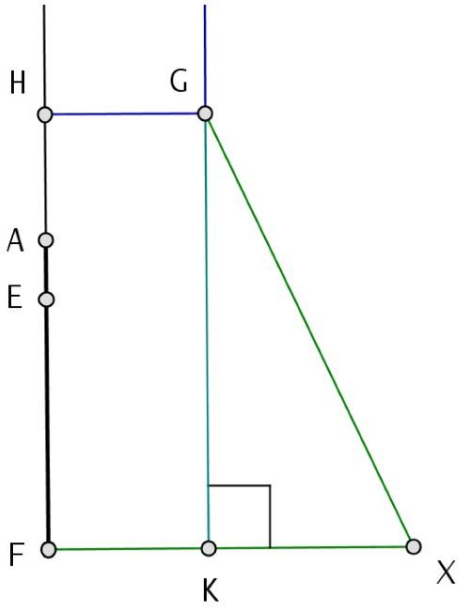
$\triangle AFX \rightarrow AX=$

$(A+EF)^2+FX^2=AX^2$

$AX=\sqrt{(k+l)^2+(\sqrt{r^2-l^2})^2}$



EX=r
EF=l
AE=k
GH=w
AH=?



GX=AX

KX=FX-w

Pythagorean Theorem:

$\triangle GKX \rightarrow GK$

$GX^2+KX^2=GX^2$

$GX=\sqrt{(r^2-l^2)+(l+k)^2-(\sqrt{r^2-l^2}-w)^2}$

AH=GK-l-k

- Will work with any angle but to find best angle:

→ =angle tangent to circle made at G-angle tangent at A

- Can shift into any space longer than car but this formula finds distance needed to pull forward only once.

- Assuming: -extreme points on cars are rectangles
  -road is flat & kerb is straight
  -others cars are parked straight and extreme points line up closely.

w=61”
k=37”
l=305”
r=426”
length of car=14.1’

=20.7

Citations

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