



6.1 Lines

Seeing more · Robot club · about 15 min

Name _____

Class _____

Date _____

What this lesson is about

The line detector: `cx` and `angle`, and the empty list.

- The line detector
- Move and look again
- When there is no line
- Where the numbers come from

Questions

6 marks in all

1. With `set_cv("line")` on, what does `line()` give when a line is in view? [1 mark]
☐ A `[cx, angle]`
☐ B `[cx, cy, distance]`
☐ C `[id, cx, cy, distance]`
☐ D `[cx, cy, area, x0, y0, x1, y1, aspect]`
2. The robot turns right by 20 degrees while looking at a line that runs straight ahead. What happens to the line's `angle`? [1 mark]
☐ A It goes negative: the line seems to swing left
☐ B It goes positive: the line seems to swing right
☐ C It stays 0
☐ D It becomes `[]`
3. Ten centimetres ahead, one pixel is about 0.108 cm. A line has `cx = 197`. About how many cm to the right of centre is it, to one decimal place? [1 mark]

4. The detector sees about 35 cm across the strip 10 cm ahead. About how many cm to the side can the line be before it drops out of view? [1 mark]

5. What does this program print? [1 mark]

```
for seen in [[197, 5], []]:
    if seen:
        cx, angle = seen
        print(f"line at cx {cx}, angle {angle}")
    else:
        print("no line")
```


6. The task starter just calls `print(line())`. What is it missing?

[1 mark]

- ☐ A `set_cv("line")`, to switch on the line detector
- ☐ B `set_cv("apriltag")`
- ☐ C `forward(50)`, because the line detector only works when moving
- ☐ D Nothing, `line()` always works

The task: see the line

Print `line` at `cx <cx>`, angle `<angle>` from the detector. Do not drive.

```
# the two lines every program starts with: the commands, then the robot
from bugbot import *
connect()

print(line())
```

Plan your program here, then type it in and press Run.



Do it on the robot

www.bugbotlab.com/learn/6-1-lines/

The simulator checks it and tells you when it passes. Nothing to install, no account.

Challenges

1. Print `cx` as a distance in centimetres. Ten centimetres ahead, one pixel is about 0.108 cm.
2. Turn left in steps of 5 degrees and print the angle each time. When does the line leave the view?
3. Drive forward 30 cm and print the line reading every 5 cm.