Python Mathematics Work Sheet

Basics, Movement, Colour and Pen

`import turtle`	Makes the turtle commands available for our program. **Needed at the start of the file.**
`.shape("turtle")`	Set the shape. It can be turtle, circle, arrow, classic.
`.speed(0)`	Sets the animation speed. 1 = slowest, 10-fastest.
`.forward(distance)`	Move forward by 'distance' steps. E.g. forward(100)
`.backward(distance)`	Move backward by 'distance' steps. E.g. backward (100)
`.right(angle)`	Turn right (clockwise) 'angle' degrees. E.g. right(120)
`.left(angle)`	Turn left (anticlockwise) 'angle' degrees. E.g. left(72)
`.goto(x,y)`	Go to the x , y position in the grid. E.g. goto(100,120)
`.pencolor("brown")`	Set the drawing colour of the shape. Replace "brown" with any valid Python colour.
`.fillcolor("blue")`	Set the fill colour of the shape. Replace "blue" with any valid Python colour.
`.begin_fill()`	Sets the starting position of the shape to fill.
`.end_fill()`	Sets the ending position of the shape to fill.
`.penup()`	Picks the pen up from the screen to stop drawing.
`.pendown()`	Places the pen down on the screen to start drawing.

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Activity: Running Code

1. Run the following code. Find out the name of the shape that's drawn and write it down on this sheet. Keep your answers and use them in the online quiz for this activity pack.

A)

```
casey.forward(100)
casey.right(120)
casey.forward(100)
casey.right(120)
casey.forward(100)
casey.right(120)
```

Answer _____

B)

```
luke.forward(100)
luke.right(72)
luke.forward(100)
luke.right(72)
luke.forward(100)
luke.right(72)
luke.forward(100)
luke.right(72)
luke.forward(100)
luke.right(72)
```

Answer _____

C)

```
for i in range(8):
        rand.forward(50)
        rand.right(45)
```

Answer _____

D)

```
for i in range(9):
        rand.forward(50)
        rand.right(360 / 9)
```

Answer _____
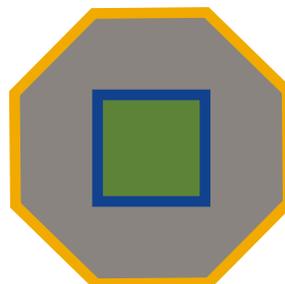
Python Mathematics Work Sheet
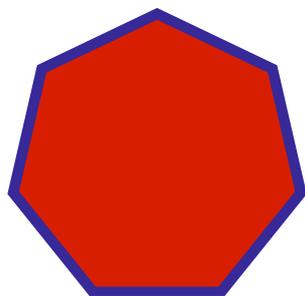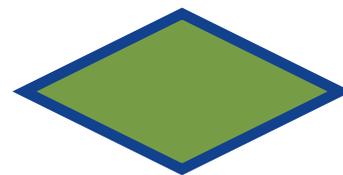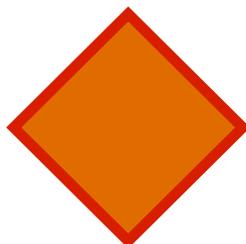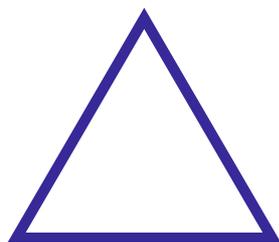
Activity: Shape Facts

2. Fill in the blanks for each description of a shape. Once you have done so, try drawing them in Python Turtle.

a) A **square** has _____ (how many?) sides. Each side is the **same** length. It also has _____ (how many?) **internal angles**. Each one is _____ **degrees**.

b) _____ (scalene/isosceles/equilateral/right-angle) **triangles** have 3 sides all the same length. That means that we _____ (know/don't know) the size of the **internal angles**. Without using a **For Loop** we can draw a triangle using _____ (how many?) lines of Python code.

c) A _____ (name?) has 12 sides of equal length. We can find out its **exterior angle** by doing _____ ÷ 12. This equals _____, and is the value we should put between the brackets of the _____ (.forward()/.right()/.goto()) command to turn.

d) An **Icosagon** has _____ (how many?) sides of equal length. We can find out its **exterior angle** by doing _____ ÷ _____. This equals _____. We can use the **exterior angle** to find the **interior angle**. To do this we get the **exterior angle** and we do **180°** _____ (plus/divide/minus/times) the **exterior angle**.

Activity: Code the Shape

3. Try and draw the shapes below using nothing but Python Turtle code. Make sure to get the right **outline** and **fill** colours.

KEITH