1. What is the output of the following:

```python
a = 6
b = a//4
c = a%4
d = a/4
print(a,b,c,d)
```

```python
a,b = b,c
d = b**c
print(a,b,c,d)
```

2. Write Python code that prompts the user for the number of dollars and prints out the equivalent amount in euros.

   Useful formula: 1 US dollar = 0.7781 euros.

3. Write the following formulas in Python:

   (a) \( x^2 + 2xy + y^2 \)

   (b) \( \sin\left(\frac{x}{2} - u\right) \)

   (c) \( r = \sqrt{\frac{\text{surface Area}}{4\pi}} \)

   (d) \( \text{effectiveRate} = (1 + \frac{r}{n})^n - 1 \)

4. (a) What is the output of the following:

   ```python
   for count in range(5):
       print(count, count+1)
   ```

   (b) What is the output of the following:

   ```python
   for k in [0,-2,2,-4,4]:
       print(k, "": ", abs(k))
   ```

5. Draw what would be displayed in the graphics window when the following program is executed:

   ```python
   from graphics import *
   def main():
       win = GraphWin("What's displayed?")
p1 = Point(10,100)
p2 = Point(100,10)
p3 = Point(190,100)
p4 = Point(100,190)
c1 = Circle(p1,5)
c2 = Circle(p2,5)
l1 = Line(p1, p2)
l2 = Line(p3, p4)
c1.draw(win)
c2.draw(win)
l1.draw(win)
l2.draw(win)
win.getMouse()
win.close()
```
6. Write Python code that will:

(a) Add the even numbers from 1000 to 2000 inclusive.
(b) Print the multiples of 7 from 700 to 7000 inclusive.

7. Write a program that will produce this shape in a graphics window:

8. (a) What is the output of the following:
```python
i = 1
j = 3
for num in range(5,10):
    i = i + (num * 2)
    print(i)
    i, j = j, i
```
(b) What is the output of the following:
```python
balance = 10
for i in range(1,8,2):
    balance = balance + (3 * i)
    print(balance)
```

9. Write a **complete** graphics-based program that requires the user to click on six points in its window. The program then draws a line hexagon (6-sided polygon) with the six points for its corners.

10. Write a **complete** program that asks the user the number of items they ordered at a restaurant. Your program should then use a loop that asks for the price of each item ordered and print out a running total of the cost of the meal (that is, after asking for each price, print out the amount spent so far).

---

**Graphics Reference:** (from p 108-111 of the textbook)

<table>
<thead>
<tr>
<th>GraphWin Objects</th>
<th>Graphics Objects</th>
<th>Text Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>GraphWin(title, width, height)</td>
<td>setFill(color)</td>
<td>Text(anchorPoint, string)</td>
</tr>
<tr>
<td>plot(x,y,color)</td>
<td>setOutline(color)</td>
<td>setText(string)</td>
</tr>
<tr>
<td>plotPixel(x,y,color)</td>
<td>setWidth(pixels)</td>
<td>getText()</td>
</tr>
<tr>
<td>setBackground(color)</td>
<td>draw(aGraphWin)</td>
<td>getAnchor()</td>
</tr>
<tr>
<td>close()</td>
<td>undraw()</td>
<td>setFace(family)</td>
</tr>
<tr>
<td>getMouse()</td>
<td>move(dx,dy)</td>
<td>setSize(point)</td>
</tr>
<tr>
<td>checkMouse()</td>
<td>clone()</td>
<td>setStyle(style)</td>
</tr>
<tr>
<td>setCoords(xll,yll,xur,yur)</td>
<td></td>
<td>setTextColor(color)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Point Methods</th>
<th>Line Methods</th>
<th>Circle Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point(x,y)</td>
<td>Line(point1, point2)</td>
<td>Circle(centerPoint, radius)</td>
</tr>
<tr>
<td>getI()</td>
<td>setArrow(string)</td>
<td>getCenter()</td>
</tr>
<tr>
<td>getY()</td>
<td>getCenter()</td>
<td>getRadius()</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rectangle Methods</th>
<th>Oval Methods</th>
<th>Polygon Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangle(point1,point2)</td>
<td>Oval(point1, point2)</td>
<td>Polygon(P1, P2, P3,...)</td>
</tr>
<tr>
<td>getCenter()</td>
<td>getCenter()</td>
<td>getPoints()</td>
</tr>
<tr>
<td>getP1(), getP2()</td>
<td>getP1(), getP2()</td>
<td></td>
</tr>
</tbody>
</table>
1. What is the output of the following:

```python
a = 5
b = a//2
c = a%2
d = a/2
print(a,b,c,d)
a,b = b,c
d = abs(b-a)
print(a,b,c,d)
```

2. Write Python code that prompts the user for the number of euros and prints out the equivalent amount in dollars.
   Useful formula: 1 euro = 1.2852 US dollars.

3. Write the following formulas in Python:
   (a) \( a^2 + 2ab + b^2 \)
   (b) \( \sqrt{\cos(2u) + \sin(2u)} \)
   (c) \( v = \frac{4}{3}\Pi r^3 \)
   (d) \( bondValue = \frac{F}{(1+r)^t} \)

4. (a) What is the output of the following:
   ```python
   for count in range(5):
       print(count-1, count)
   ```
   (b) What is the output of the following:
   ```python
   for k in [-2,0,2,-1,1]:
       print(k, " ": k*2)
   ```

5. Draw what would be displayed in the graphics window when the following program is executed:

```python
from graphics import *

def main():
    win = GraphWin("What's displayed?")
p1 = Point(10,10)
p2 = Point(10,190)
p3 = Point(190,10)
p4 = Point(190,190)
c1 = Circle(p1, 5)
c2 = Circle(p2, 5)
l1 = Line(p1, p4)
l2 = Line(p2, p3)
c1.draw(win)
c2.draw(win)
l1.draw(win)
l2.draw(win)
win.getMouse()
win.close()
```
6. Write Python code that will:

(a) Add the odd numbers from 999 to 9999 inclusive.
(b) Print the multiples of 8 from 888 to 8000 inclusive.

7. Write a program that will produce this shape in a graphics window:

![Shape Image]

8. (a) What is the output of the following:

```python
i = 4
j = 6
for num in range(1, 6):
    i = i + (num * 2)
    print(i)
    i, j = j, i
```

(b) What is the output of the following:

```python
balance = 100
for i in range(2, 12, 3):
    balance = balance + (3 * i)
    print(balance)
```

9. Write a complete graphics-based program that requires the user to click on four points in its window. Your program should connect all the points with lines (to form a 4-sided polygon). Your program should also draw circles (of radius 5) at all points clicked.

10. Write a complete program that asks the user the number of games they would like to purchase. Your program should then ask the price of each game and print out a running total of the amount spent (that is, after asking for each price, print out the amount spent so far).

---

Graphics Reference: (from p 108-111 of the textbook)

<table>
<thead>
<tr>
<th>GraphWin Objects</th>
<th>Graphics Objects</th>
<th>Text Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>GraphWin(title, width, height)</td>
<td>setFill(color)</td>
<td>Text(anchoring, string)</td>
</tr>
<tr>
<td>plot(x,y,color)</td>
<td>setOutline(color)</td>
<td>setText(string)</td>
</tr>
<tr>
<td>plotPixel(x,y,color)</td>
<td>setWidth(pixels)</td>
<td>getText()</td>
</tr>
<tr>
<td>setBackground(color)</td>
<td>draw(aGraphWin)</td>
<td>getAnchor()</td>
</tr>
<tr>
<td>close()</td>
<td>undraw()</td>
<td>setFace(family)</td>
</tr>
<tr>
<td>getMouse()</td>
<td>move(dx,dy)</td>
<td>setSize(point)</td>
</tr>
<tr>
<td>checkMouse()</td>
<td>clone()</td>
<td>setStyle(style)</td>
</tr>
<tr>
<td>setCoords(xll,yll,xur,yur)</td>
<td></td>
<td>setTextColor(color)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Point Methods</th>
<th>Line Methods</th>
<th>Circle Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point(x,y)</td>
<td>Line(point1, point2)</td>
<td>Circle(centerPoint, radius)</td>
</tr>
<tr>
<td>getX()</td>
<td>setArrow(string)</td>
<td>getCenter()</td>
</tr>
<tr>
<td>getY()</td>
<td>getCenter()</td>
<td>getRadius()</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rectangle Methods</th>
<th>Oval Methods</th>
<th>Polygon Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangle(point1,point2)</td>
<td>oval1(point1, point2)</td>
<td>Polygon(P1, P2, P3,...)</td>
</tr>
<tr>
<td>getCenter()</td>
<td>getCenter()</td>
<td>getCenter()</td>
</tr>
<tr>
<td>getP1(), getP2()</td>
<td>getP1(), getP2()</td>
<td>getPoints()</td>
</tr>
</tbody>
</table>
1. What is the output of the following:

```python
a = 5
b = a/4
c = a%4
d = a/4
print(a,b,c,d)
a,b = b,c
d = b**c
print(a,b,c,d)
```

2. Write Python code that prompts the user for the number of dollars and prints out the equivalent amount in pesos.
   Useful formula: 1 US dollar = 12.8630 Mexican pesos.

3. Write the following formulas in Python:

   (a) \( x^2 - 4xy + y^2 \)
   (b) \( \sin\left(\frac{\pi}{2} - u\right) \)
   (c) \( r = \sqrt{\frac{\text{area}}{\pi}} \)
   (d) \( \text{compound} = P(1 + \frac{r}{n})^{n \cdot t} \)

4. (a) What is the output of the following:
   ```python
   for count in range(5):
       print(2*count)
   ```
   (b) What is the output of the following:
   ```python
   for k in [0,-2,2,-4,4]:
       print(k, " ", abs(k))
   ```

5. Draw what would be displayed in the graphics window when the following program is executed:

```python
from graphics import *

def main():
    win = GraphWin("What’s displayed?")
p1 = Point(10,10)
p2 = Point(100,190)
p3 = Point(100,10)
p4 = Point(190,190)
r1 = Rectangle(p1, p2)
r2 = Rectangle(p3, p4)
l1 = Line(p1, p2)
l2 = Line(p3, p4)
r1.draw(win)
r2.draw(win)
l1.draw(win)
l2.draw(win)
win.getMouse()
win.close()
```
6. Write Python code that will:

(a) Add the odd numbers from 2013 to 10001 inclusive.

(b) Print the multiples of 6 from 66 to 600 inclusive.

7. Write a program that will produce this shape in a graphics window:

8. (a) What is the output of the following:

```python
i = 2
j = 5
for num in range(6,11):
    i = i + (num * 2)
    print(i)
    i, j = j, i
```

(b) What is the output of the following:

```python
balance = 150
for i in range(5,9,1):
    balance = balance + (3 * i)
    print(balance)
```

9. Write a complete graphics-based program that requires the user to click on six points in its window. The program then draws a line hexagon (6-sided polygon) with the six points for its corners.

10. Write a complete program that asks the user the number of shoes they will be purchasing at the shoe store. Your program should then use a loop that asks for the cost of each shoe and print out a running total of the amount spent (that is, after asking for each price, print out the amount spent so far).

---

*Graphics Reference:* (from p 108-111 of the textbook)

<table>
<thead>
<tr>
<th>GraphWin OObjects</th>
<th>Graphics Objects</th>
<th>Text Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>GraphWin(title, width, height)</td>
<td>setFill(color)</td>
<td>Text(anchroPoint, string)</td>
</tr>
<tr>
<td>plot(x,y,color)</td>
<td>setOutline(color)</td>
<td>setText(string)</td>
</tr>
<tr>
<td>plotPixel(x,y,color)</td>
<td>setWidth(pixels)</td>
<td>getAnchor()</td>
</tr>
<tr>
<td>setBackgroundColor(color)</td>
<td>draw(aGraphWin)</td>
<td>setFace(family)</td>
</tr>
<tr>
<td>close()</td>
<td>undraw()</td>
<td>setSize(point)</td>
</tr>
<tr>
<td>getMouse()</td>
<td>clone()</td>
<td>setStyle(style)</td>
</tr>
<tr>
<td>checkMouse()</td>
<td>move(dx,dy)</td>
<td>setTextColor(color)</td>
</tr>
<tr>
<td>setCoords(xll,yll,xur,yur)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Point Methods</th>
<th>Line Methods</th>
<th>Circle Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point(x,y)</td>
<td>Line(point1, point2)</td>
<td>Circle(centerPoint, radius)</td>
</tr>
<tr>
<td>getX()</td>
<td>setArrow(string)</td>
<td>getCenter()</td>
</tr>
<tr>
<td>getY()</td>
<td>getCenter()</td>
<td>getRadius()</td>
</tr>
<tr>
<td></td>
<td>getP1(), getP2()</td>
<td>getP1(), getP2()</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rectangle Methods</th>
<th>Oval Methods</th>
<th>Polygon Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangle(point1,point2)</td>
<td>Oval(point1, point2)</td>
<td>Polygon(P1, P2, P3,...)</td>
</tr>
<tr>
<td>getCenter()</td>
<td>getCenter()</td>
<td>getPoints()</td>
</tr>
<tr>
<td>getP1(), getP2()</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. What is the output of the following:

```python
a = 7
b = a/2
c = a%2
d = a/2
print(a,b,c,d)
a,b = b,c
d = abs(b-a)
print(a,b,c,d)
```

2. Write Python code that prompts the user for the number of dollars and prints out the equivalent amount in krone.
   Useful formula: 1 US dollar = 5.8012 Danish krone.

3. Write the following formulas in Python:
   (a) \( y^2 - yz + z^2 \)
   (b) \( \tan\left(\frac{\pi}{2}\right) - 1 \)
   (c) \( \text{side} = \sqrt{\frac{\text{surface area}}{6}} \)
   (d) \( \text{numPayments} = \frac{-\log(1-r)}{\log(1+r)} \)

4. (a) What is the output of the following:

   ```python
   for count in range(5):
       print(count-1, count+1)
   ```

   (b) What is the output of the following:

   ```python
   for k in [-2,2,-1,1,0]:
       print(k, ": ", k*2)
   ```

5. Draw what would be displayed in the graphics window when the following program is executed:

   ```python
   from graphics import *
   def main():
       win = GraphWin("What’s displayed?")
p1 = Point(10,100)
p2 = Point(100,10)
p3 = Point(190,100)
p4 = Point(100,190)
c1 = Circle(p1,5)
c2 = Circle(p2,5)
l1 = Line(p1, p3)
l2 = Line(p2, p4)
c1.draw(win)
c2.draw(win)
l1.draw(win)
l2.draw(win)
win.getMouse()
win.close()
```
6. Write Python code that will:

(a) Add the even numbers from 1900 to 2000 inclusive.

(b) Print the multiples of 17 from 17 to 1700 inclusive.

7. Write a program that will produce this shape in a graphics window:

8. (a) What is the output of the following:

```
i = 5
j = 2
for num in range(3,8):
    i = i + (num * 2)
    print(i)
i, j = j, i
```

(b) What is the output of the following:

```
balance = 75
for i in range(1,14,4):
    balance = balance + (3 * i)
    print(balance)
```

9. Write a complete graphics-based program that requires the user to click on four points in its window. Your program should connect all the points with lines (to form a 4-sided polygon). Your program should also draw circles (of radius 5) at all points clicked.

10. Write a complete program that asks the user the number stations they will be stopping at on their subway ride. Your program should then use a loop that asks for the distance between each station and print out a running total of the distance traveled (that is, after asking for each distance, print out the distance travelled so far).

---

Graphics Reference: (from p 108-111 of the textbook)

<table>
<thead>
<tr>
<th>GraphWin Objects</th>
<th>Graphics Objects</th>
<th>Text Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>GraphWin(title, width, height)</td>
<td>setFill(color)</td>
<td>Text(anchorPoint, string)</td>
</tr>
<tr>
<td>plot(x,y,color)</td>
<td>setOutline(color)</td>
<td>setText(string)</td>
</tr>
<tr>
<td>plotPixel(x,y,color)</td>
<td>setWidth(pixels)</td>
<td>getFont()</td>
</tr>
<tr>
<td>setBackground(color)</td>
<td>draw(aGraphWin)</td>
<td>getAnchor()</td>
</tr>
<tr>
<td>close()</td>
<td>undraw()</td>
<td>setFace(family)</td>
</tr>
<tr>
<td>getMouse()</td>
<td>move(dx,dy)</td>
<td>setSize(point)</td>
</tr>
<tr>
<td>checkMouse()</td>
<td>clone()</td>
<td>setStyle(style)</td>
</tr>
<tr>
<td>setCoords(xll,yll,xur,yur)</td>
<td></td>
<td>setTextColor(color)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Point Methods</th>
<th>Line Methods</th>
<th>Circle Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point(x,y)</td>
<td>Line(point1, point2)</td>
<td>Circle(centerPoint, radius)</td>
</tr>
<tr>
<td>getX()</td>
<td>setArrow(string)</td>
<td>getCenter()</td>
</tr>
<tr>
<td>getY()</td>
<td>getCenter()</td>
<td>getRadius()</td>
</tr>
</tbody>
</table>

| Rectangle Methods | Oval Methods | Polygon Methods |
|-------------------|--------------|----------------
| Rectangle(point1,point2) | Oval(point1, point2) | Polygon(P1, P2, P3,...) |
| getCenter() | getCenter() | getPoints() |
| getP1(), getP2() | | |