NAME:

EMAIL:

SIGNATURE:

CIRCLE COURSE SECTION: TTH 11-1 MW 1-3 TTH 4-6 MW 6-8
                          MW 4-6   MW 11-1 MW 9-11

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total	

Lehman College, CUNY

CMP 230 Exam 1, Version 1, Spring 2013

1. What is the output of the following:

```
a = 9
b = a//2
c = a%2
d = a/2
print(a,b,c,d)
a,b = b,c
d = b**c
print(a,b,c,d)
```

Output:

2. Write Python code that prompts the user for the number of inches (in) and prints out the equivalent number of centimeters (cm).
   Useful formula: $1in = 2.54cm$.

3. Write the following formulas in Python:

   (a) $2x^8 + 2xy + 3y^4$
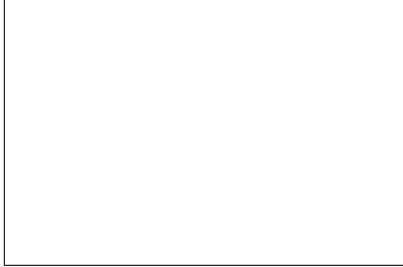
   (c) $c = \sqrt{a^2 + b^2}$

   (b) $\cos(\frac{\pi}{4})$

   (d) $F = (G\frac{m_1 m_2}{r^2})$

1

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

```
for count in range(2,27,6):
    print(count*2, count/2)
```
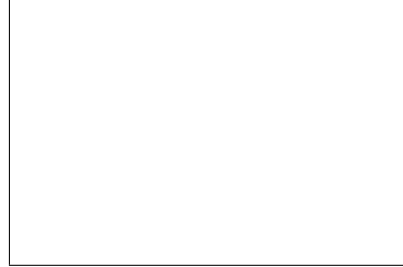
Output:

(b) What is the output of the following:

```
for k in [0,1,-1,2,-2,3,-3]:
    print(k, ":", abs(k))
```
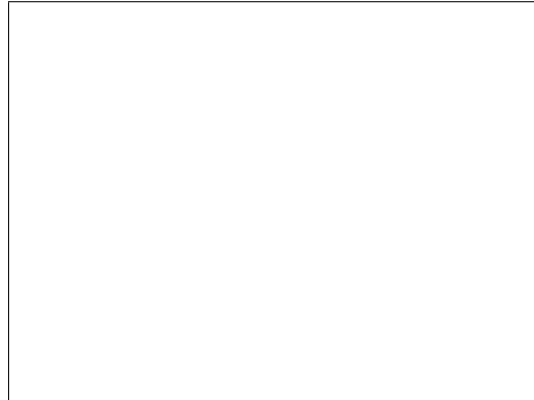
Output:

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

```
from turtle import *
def draw():
    t = Turtle()
    t.forward(150)
    for i in range(3):
        t.left(90)
        t.forward(50)
    for i in range(3):
        t.forward(50)
        t.right(90)
    for i in range(3):
        t.left(90)
        t.forward(50)
draw()
```

Graphics Displayed:

6. You are on a mission and need to know how far you are from home base. Write a program which asks you for the (x, y) coordinates of your current location and calculates and displays the distance from that point to your home base, which is located at coordinates $(10, 12)$. Useful formula: If $p = (x_1, y_1)$ and $q = (x_2, y_2)$ then $dist(p, q) = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$.

7. Write a program that will produce this shape in a graphics window:
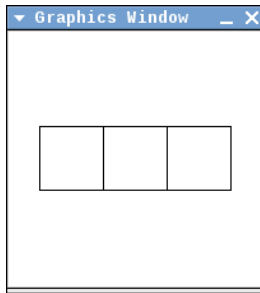
8. (a) What is the output of the following:

```
mult = 2
total = 0
for i in range(1,6):
    total = total + (i * mult)
    print(total)
    mult = mult + 1
```

Output:

(b) What is the output of the following:

```
total = 1
for i in range(8,17,2):
    total = total * (i/2)
    print(total)
```

Output:

9. Write a **complete** graphics-based program (using the graphics library, not turtles) that opens a graphics window, allows the user to click on three different points $p1, p2, p3$ within the window. Your program should then draw the three points and a large circle around $p1$, a medium circle around $p2$ and a small circle around $p3$.

10. Write a **complete** program to help a group of friends planning to travel to Costa Rica. Each of the friends will put in the same amount of money in U.S. Dollars. Your program will prompt the user to input the number of friends and the amount they are each putting in. Your program will compute the total amount being converted from U.S. Dollars to Costa Rican Colones and it will perform the conversion, and output the total amount of U.S. Dollars, the total amount of Colones and the amount each friend will receive in Colones. Useful formula: **1 US Dollar = 500 Colones**.

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

GraphWin Objects
```
GraphWin(title, width, height)
plot(x,y,color)
plotPixel(x,y,color)
setBackground(color)
close()
getMouse()
checkMouse()
setCoords(xll,yll,xur,yur)
```

Graphics Objects
```
setFill(color)
setOutline(color)
setWidth(pixels)
draw(aGraphWin)
undraw()
move(dx,dy)
clone()
```

Text Methods
```
Text(anchorPoint, string)
setText(string)
getText()
getAnchor()
setFace(family)
setSize(point)
setStyle(style)
setTextColor(color)
```

Point Methods
```
Point(x,y)
getX()
getY()
```

Line Methods
```
Line(point1, point2)
setArrow(string)
getCenter()
getP1(), getP2()
```

Circle Methods
```
Circle(centerPoint, radius)
getCenter()
getRadius()
getP1(), getP2()
```

Rectangle Methods
```
Rectangle(point1,point2)
getCenter()
getP1(), getP2()
```

Oval Methods
```
Oval(point1, point2)
getCenter()
getP1(), getP2()
```

Polygon Methods
```
Polygon(P1, P2, P3,...)
getPoints()
```

6

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total	

Lehman College, CUNY
CMP 230 Exam 1, Version 2, Spring 2013

1. What is the output of the following:

```
a = 10
b = a//4
c = a%4
d = a/4
print(a,b,c,d)
a,b = b,c
d = abs(b-a)
print(a,b,c,d)
```

Output:

2. Write Python code that prompts the user for the number of centimeter (cm) and prints out the equivalent amount inches (in).
   Useful formula: 1 cm = 0.3937 in.

3. Write the following formulas in Python:

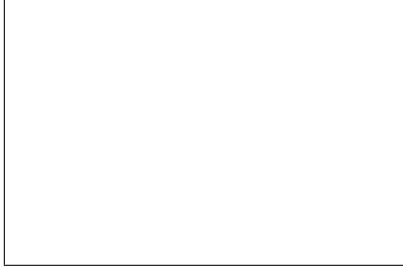   (a) $4a^6 + 7ab + b^5$

   (c) $a = \sqrt{b^2 + c^2 - 2bc\cos(A)}$

   (b) $\tan(\frac{\pi}{8} - k)$

   (d) $T = 2\pi\sqrt{\frac{M}{k}}$

7

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

```
for count in range(4,21,4):
    print(count*2, count/2)
```
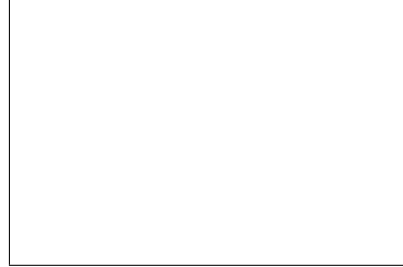
Output:

(b) What is the output of the following:

```
for k in [1,-1,0,2,-2,3,-3]:
    print(k, ":", k*3)
```
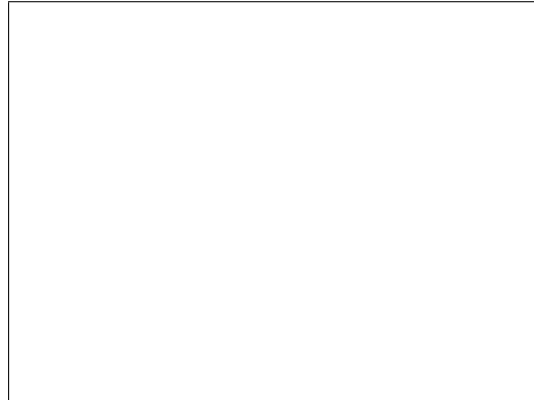
Output:

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

```
from turtle import *
def draw():
    t = Turtle()
    t.left(90)
    t.forward(150)
    for i in range(3):
        t.left(90)
        t.forward(50)
    for i in range(3):
        t.forward(50)
        t.right(90)
    for i in range(3):
        t.left(90)
        t.forward(50)
draw()
```

Graphics Displayed:

6. Write a program that asks the user for the two shorter sides of a right triangle, a and b, and then calculates and displays the length of the hypotenuse, c. Useful formula: $a^2 + b^2 = c^2$.

8

7. Write a program that will produce this shape in a graphics window:
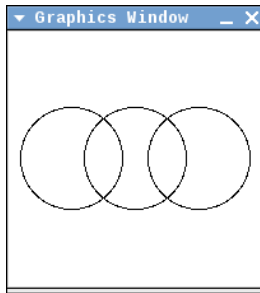
8. (a) What is the output of the following:

```
mult = 5
total = 0
for i in range(5,10):
    total = total + (i * mult)
    print(total)
    mult = mult - 1
```

Output:

(b) What is the output of the following:

```
total = 1
for i in range(4,21,4):
    total = total * (i/2)
    print(total)
```

Output:

9. Write a **complete** graphics-based program (using the graphics library, not turtles) that opens a graphics window, allows the user to click on three different points $p1, p2, p3$ within the window. Your program should then draw the three points and lines connecting the three points.

10. Write a **complete** program to help a group of friends planning to travel to Lebanon. Each of the friends will put in the same amount of money in U.S. Dollars. Your program will prompt the user to input the number of friends and the amount they are each putting in. Your program will compute the total amount being converted from U.S. Dollars to Lebanese Pounds and it will perform the conversion, and output the total amount of U.S. Dollars, the total amount of Lebanese Pounds and the amount each friend will receive in Lebanese Pounds. Useful formula: **1 US Dollar = 0.000664 Lebanese Pounds**.

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

GraphWin Objects
```
GraphWin(title, width, height)
plot(x,y,color)
plotPixel(x,y,color)
setBackground(color)
close()
getMouse()
checkMouse()
setCoords(xll,yll,xur,yur)
```

Graphics Objects
```
setFill(color)
setOutline(color)
setWidth(pixels)
draw(aGraphWin)
undraw()
move(dx,dy)
clone()
```

Text Methods
```
Text(anchorPoint, string)
setText(string)
getText()
getAnchor()
setFace(family)
setSize(point)
setStyle(style)
setTextColor(color)
```

Point Methods
```
Point(x,y)
getX()
getY()
```

Line Methods
```
Line(point1, point2)
setArrow(string)
getCenter()
getP1(), getP2()
```

Circle Methods
```
Circle(centerPoint, radius)
getCenter()
getRadius()
getP1(), getP2()
```

Rectangle Methods
```
Rectangle(point1,point2)
getCenter()
getP1(), getP2()
```

Oval Methods
```
Oval(point1, point2)
getCenter()
getP1(), getP2()
```

Polygon Methods
```
Polygon(P1, P2, P3,...)
getPoints()
```

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total	

Lehman College, CUNY
CMP 230 Exam 1, Version 3, Spring 2013

1. What is the output of the following:

```
a = 7
b = a//2
c = a%2
d = a/2
print(a,b,c,d)
a,b = b,c
d = b**c
print(a,b,c,d)
```

Output:

2. Write Python code that prompts the user for the number of kilograms (kg) and prints out the equivalent amount in ounces (oz).
   Useful formula: 1 kg = 35.2 oz.

3. Write the following formulas in Python:

   (a) $6x^8 - 4xy + 7y^9$

   (c) $b = \sqrt{a^2 + c^2 - 2ac\cos(B)}$
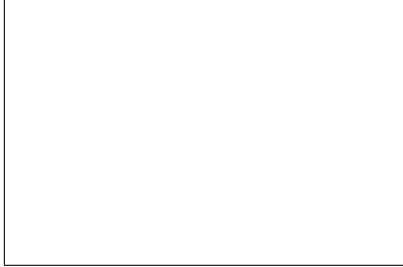
   (b) $\sin(\frac{\pi}{6} - w)$

   (d) $f = cR\sqrt{\frac{1}{n} - \frac{1}{m}}$

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

```
for count in range(2,13,2):
    print(count*2, count/2)
```
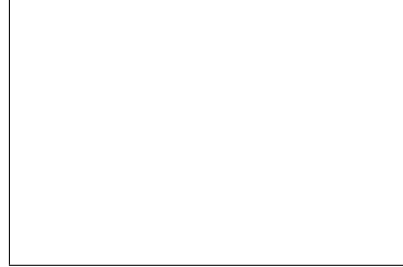
Output:

(b) What is the output of the following:

```
for k in [1,-1,3,-3,0,2,-2]:
    print(k, ":", k**2)
```
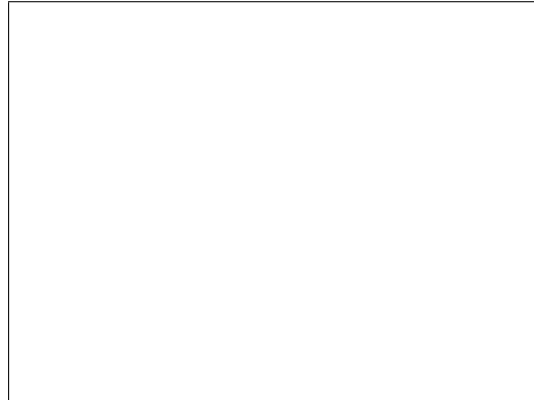
Output:

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

```
from turtle import *
def draw():
    t = Turtle()
    t.right(90)
    t.forward(150)
    for i in range(3):
        t.left(90)
        t.forward(50)
    for i in range(3):
        t.forward(50)
        t.right(90)
    for i in range(3):
        t.left(90)
        t.forward(50)
draw()
```

Graphics Displayed:

6. Write a program that asks the user for one of the shorter sides of a right triangle, a, and the hypotenuse, c, and then calculates and displays the length of the other shorter side, b. Useful formula: $a^2 + b^2 = c^2$.

7. Write a program that will produce this shape in a graphics window:
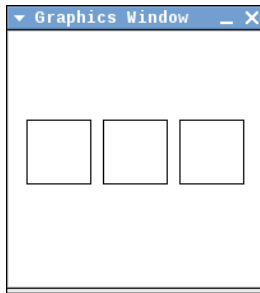
8. (a) What is the output of the following:

```
mult = 2
total = 0
for i in range(3,8):
    total = total + (i * mult)
    print(total)
    mult = mult + 1
```
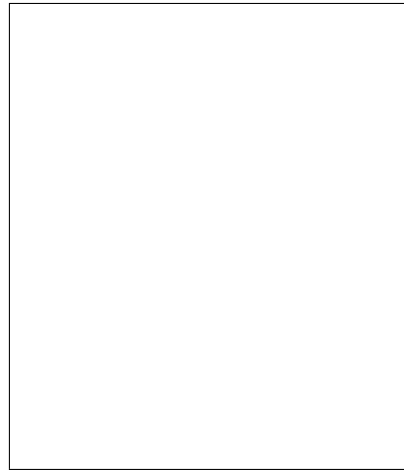
Output:

(b) What is the output of the following:

```
total = 1
for i in range(6,31,6):
    total = total * (i/2)
    print(total)
```

Output:

9. Write a **complete** graphics-based program (using the graphics library, not turtles) that opens a graphics window, allows the user to click on four different points $p1, p2, p3, p4$ within the window. Your program should then draw the four points and 2 rectangles, the first defined by $p1, p2$ and the second defined by $p3, p4$.

10. Write a **complete** program to help a group of friends planning to travel to Indonesia. Each of the friends will put in the same amount of money in U.S. Dollars. Your program will prompt the user to input the number of friends and the amount they are each putting in. Your program will compute the total amount being converted from U.S. Dollars to Indonesian Rupiahs and it will perform the conversion, and output the total amount of U.S. Dollars, the total amount of Indonesian Rupiahs and the amount each friend will receive in Indonesian Rupiahs. Useful formula: **1 US Dollar = 9639.99 Indonesian Rupiahs**.

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

GraphWin Objects
```
GraphWin(title, width, height)
plot(x,y,color)
plotPixel(x,y,color)
setBackground(color)
close()
getMouse()
checkMouse()
setCoords(xll,yll,xur,yur)
```

Graphics Objects
```
setFill(color)
setOutline(color)
setWidth(pixels)
draw(aGraphWin)
undraw()
move(dx,dy)
clone()
```

Text Methods
```
Text(anchorPoint, string)
setText(string)
getText()
getAnchor()
setFace(family)
setSize(point)
setStyle(style)
setTextColor(color)
```

Point Methods
```
Point(x,y)
getX()
getY()
```

Line Methods
```
Line(point1, point2)
setArrow(string)
getCenter()
getP1(), getP2()
```

Circle Methods
```
Circle(centerPoint, radius)
getCenter()
getRadius()
getP1(), getP2()
```

Rectangle Methods
```
Rectangle(point1,point2)
getCenter()
getP1(), getP2()
```

Oval Methods
```
Oval(point1, point2)
getCenter()
getP1(), getP2()
```

Polygon Methods
```
Polygon(P1, P2, P3,...)
getPoints()
```

Name:
Email:
Signature:
Circle course section: TTh 11-1   MW 1-3   TTh 4-6   MW 6-8
                          MW 4-6   MW 11-1   MW 9-11

Lehman College, CUNY
CMP 230 Exam 1, Version 4, Spring 2013

1. What is the output of the following:

```
a = 11
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)
```

Output:

2. Write Python code that prompts the user for the number ounces (oz) and prints out the equivalent amount in kilograms (kg).
   Useful formula: 1 oz = 0.028409 kg.

3. Write the following formulas in Python:

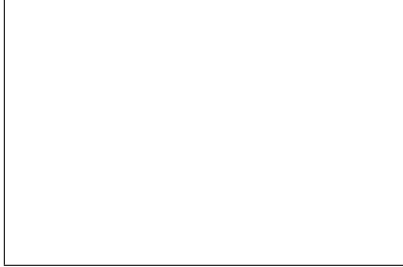   (a) $4y^6 - 5yz + 6z^5$

   (c) $c = \sqrt{a^2 + b^2 - 2ab\cos(C)}$

   (b) $\tan(\frac{\pi}{8}) - 1$

   (d) $A = P(1 + \frac{r}{n})^{nt}$

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

```
for count in range(6,31,6):
    print(count*2, count/2)
```
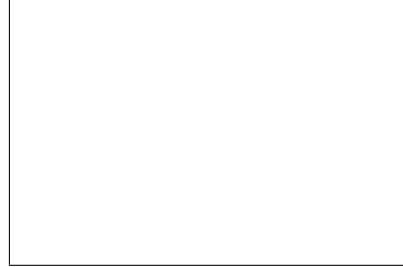
Output:

(b) What is the output of the following:

```
for k in [3,-3,0,1,-1,2,-2]:
    print(k, ":", k*4)
```
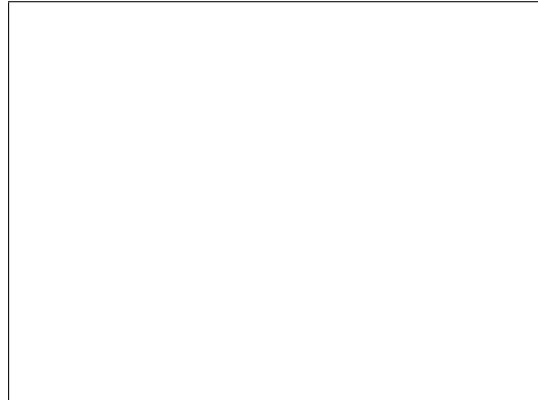
Output:

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

```
from turtle import *
def draw():
    t = Turtle()
    t.right(180)
    t.forward(150)
    for i in range(3):
        t.left(90)
        t.forward(50)
    for i in range(3):
        t.forward(50)
        t.right(90)
    for i in range(3):
        t.left(90)
        t.forward(50)
draw()
```

Graphics Displayed:

6. Write a program that asks the user for one of the shorter sides of a right triangle, b, and the hypotenuse, c, and then calculates and displays the length of the other shorter side, a. Useful formula: $a^2 + b^2 = c^2$.

7. Write a program that will produce this shape in a graphics window:
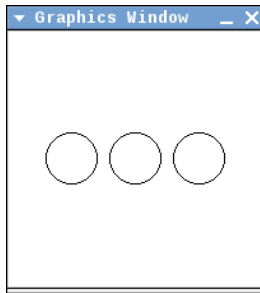
8. (a) What is the output of the following:

```
mult = 5
total = 0
for i in range(4,9):
    total = total + (i * mult)
    print(total)
    mult = mult - 1
```
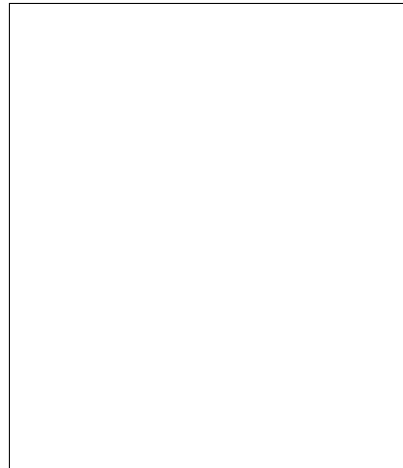
Output:

(b) What is the output of the following:

```
total = 1
for i in range(12,25,3):
    total = total * (i/3)
    print(total)
```

Output:

9. Write a **complete** graphics-based program (using the graphics library, not turtles) that opens a graphics window, allows the user to click on four different points $p1, p2, p3, p4$ within the window. Your program should then draw the four points, a line connecting $p1, p2$, a line connecting $p2, p3$, a line connecting $p3, p4$, and a line connecting $p4, p1$.

10. Write a **complete** program to help a group of friends planning to travel to Yemen. Each of the friends will put in the same amount of money in U.S. Dollars. Your program will prompt the user to input the number of friends and the amount they are each putting in. Your program will compute the total amount being converted from U.S. Dollars to Yemeni Rials and it will perform the conversion, and output the total amount of U.S. Dollars, the total amount of Yemeni Rials and the amount each friend will receive in Yemeni Rials. Useful formula: **1 US Dollar = 0.00477 Yemeni Rials**.

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

GraphWin Objects
```
GraphWin(title, width, height)
plot(x,y,color)
plotPixel(x,y,color)
setBackground(color)
close()
getMouse()
checkMouse()
setCoords(xll,yll,xur,yur)
```

Graphics Objects
```
setFill(color)
setOutline(color)
setWidth(pixels)
draw(aGraphWin)
undraw()
move(dx,dy)
clone()
```

Text Methods
```
Text(anchorPoint, string)
setText(string)
getText()
getAnchor()
setFace(family)
setSize(point)
setStyle(style)
setTextColor(color)
```

Point Methods
```
Point(x,y)
getX()
getY()
```

Line Methods
```
Line(point1, point2)
setArrow(string)
getCenter()
getP1(), getP2()
```

Circle Methods
```
Circle(centerPoint, radius)
getCenter()
getRadius()
getP1(), getP2()
```

Rectangle Methods
```
Rectangle(point1,point2)
getCenter()
getP1(), getP2()
```

Oval Methods
```
Oval(point1, point2)
getCenter()
getP1(), getP2()
```

Polygon Methods
```
Polygon(P1, P2, P3,...)
getPoints()
```