NAME:

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

Lehman College, CUNY

CMP 230 Exam 1, Version 1, Spring 2012

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1. Write Python code that prompts the user for the radius, and prints out the volume of a sphere. Useful formula: $volume = \frac{4}{3}\pi r^3$.

2. What is the output of the following:

```
a = 4
b = a**2
c = b % 5
d = b // 5
print(a,b,c,d)
a,b = b,c
print(a,b,c,d)
a = b % 2
print(a,b,c,d)
c = b = a
print(a,b,c,d)
```

3. Write the following formulas in Python:

   (a) $\frac{1}{2}(\cos(a-b) - \cos(a+b))$
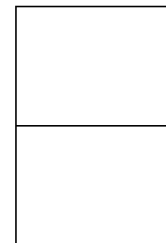
   (b) $r = \sqrt{\frac{surfaceArea}{4\pi}}$

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

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

   (b) What is the output of the following:

```
step = -3
n = 0
for j in range(12,0,step):
    n = n + j
    print(n)
print("done")
```

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

6. Write Python code that will:

   (a) Add the odd numbers from 7 to 99 inclusive

   (b) Print the multiples of 4 from 444 to 1000 inclusive

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

```
from graphics import *
def main():
    win = GraphWin("What's displayed?")
    win.setCoords(0.0, 0.0, 10.0, 10.0)
    p1 = Point(3,3)
    p2 = Point(7,7)
    c1 = Circle(p1, 2)
    c2 = Circle(p2, 2)
    l = Line(p1,p2)
    c1.draw(win)
    c2.draw(win)
    l.draw(win)
    win.getMouse()
    win.close()
```

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

```
a = 1
b = 1
for i in range(1,6):
    sum = a + b
    print(sum)
    a = b
    b = sum
```

(b) What is the output of the following:

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

9. Write a **complete** graphics-based program that requires the user to click on three points in its window. Your program should draw a circle (of radius 5) around each point as well as lines connecting the points (3 lines in total)

10. Write a **complete** program that asks the user the number of apps they would like to purchase. Your program should then ask the price of each app 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)

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:

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

Lehman College, CUNY

CMP 230 Exam 1, Version 2, Spring 2012

1. Write Python code that prompts the user for the radius, and prints out the surface area of a sphere. Useful formula: $surfaceArea = 4\pi r^2$.

2. What is the output of the following:

```
x = 4
y = x**2
w = y % 3
z = y // 2
print(x,y,w,z)
x,w = w,z
print(x,y,w,z)
x = y % 2
print(x,y,w,z)
w = y = x
print(x,y,w,z)
```

3. Write the following formulas in Python:

   (a) $\frac{\sin(x-y)}{\tan(x+y)}$
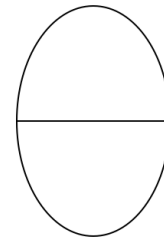
   (b) $dist = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

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

```
for i in [-5,-4,-3,-2,-1]:
    print(i)
print("zero")
```

   (b) What is the output of the following:

```
step = 2
ans = 0
for j in range(1,10,step):
    ans = ans + j
    print(j)
print(ans)
```

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

6. Write Python code that will:

   (a) Add the even numbers from 10016 to 10468 inclusive

   (b) Print the multiples of 3 from 333 to 3333 inclusive

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

```
from graphics import *
def main():
    win = GraphWin("What's displayed?")
    win.setCoords(0.0, 0.0, 10.0, 10.0)
    p1 = Point(3,3)
    p2 = Point(5,5)
    p3 = Point(7,7)
    r1 = Rectangle(p1, p2)
    r2 = Rectangle(p2, p3)
    l = Line(p1,p2)
    r1.draw(win)
    r2.draw(win)
    l.draw(win)
    win.getMouse()
    win.close()
```

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

```
old = 10
older = 1
for i in range(5,10):
    n = old - older
    print(old)
    older = old
    old = n
```

(b) What is the output of the following:

```
total = 5
s = 1
for i in range(2,7):
    s = -s
    total = total + s*i
    print(total)
```

9. Write a **complete** graphics-based program that requires the user to click on a point in its window. The program then draws 5 circles centered at that point of radius 5, 10, 15, 20, and 25, respectively.

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)

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()
```

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Lehman College, CUNY
CMP 230 Exam 1, Version 3, Spring 2012

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1. Write Python code that prompts the user for the radius, and prints out the volume of a isoceles right cone. Useful formula: $volume = \frac{1}{3}\pi r^3$.

2. What is the output of the following:

```
a = 6
b = a % 4
c = b**3
d = c // 2
print(a,b,c,d)
a,b = b,c
print(a,b,c,d)
a = b / 2
print(a,b,c,d)
c = b = a
print(a,b,c,d)
```

3. Write the following formulas in Python:

   (a) $\sin(t - u) + \cos(2t)$
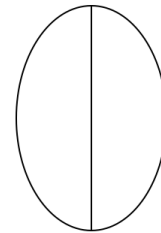
   (b) $la = \pi r \sqrt{r^2 + h^2}$

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

```
for z in [3,1,4,5,9]:
    print(z, z+1)
```

   (b) What is the output of the following:

```
step = -1
ans = 0
for j in range(5,0,step):
    ans = ans + j
    print(j)
print(ans)
```

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

6. Write Python code that will:

   (a) Add the odd numbers from 3141 to 31414 inclusive

   (b) Print the multiples of 13 from 26 to 1300 inclusive

5

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

```
from graphics import *
def main():
    win = GraphWin("What's displayed?")
    win.setCoords(0.0, 0.0, 10.0, 10.0)
    p1 = Point(1,9)
    p2 = Point(9,1)
    p3 = Point(5,5)
    r1 = Rectangle(p1, p2)
    r2 = Rectangle(p2, p3)
    l = Line(p1,p3)
    r1.draw(win)
    r2.draw(win)
    l.draw(win)
    win.getMouse()
    win.close()
```

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

```
l = 10
k = 1
for i in range(5,10):
    n = l - k
    print(l)
    l = k
    k = n
```

(b) What is the output of the following:

```
total = 5
for i in range(2,7):
    total = total + ((-1)**i)*i
    print(total)
```

9. Write a **complete** graphics-based program that requires the user to click on four points in its window. The program then draws two rectangles, the first using the first two points clicked as its bounding points, and the second using between last two points clicked as its bounding points.

10. Write a **complete** program that asks the user the number of items they plan to purchase at the grocery store. Your program should then ask the price of each item 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)

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: MW 11-1   TTh 1-3   TTh 4-6   TTh 6-8

Lehman College, CUNY

CMP 230 Exam 1, Version 4, Spring 2012

1. Write Python code that prompts the user for the radius, and prints out the surface area of an isoceles right cone. Useful formula: $surfaceArea = (1 + \sqrt{2})\pi r^2$.

2. What is the output of the following:

```
x = 6
y = x % 4
w = y**3
z = w // 2
print(x,y,w,z)
x,y = y,w
print(x,y,w,z)
x = y / 2
print(x,y,w,z)
w = y = x
print(x,y,w,z)
```

3. Write the following formulas in Python:

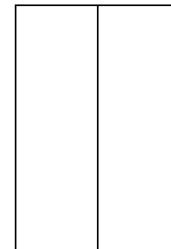   (a) $\tan(2a) + 2\sin(a)$

    (b) $v = \pi r^2 h$

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

```
for i in [2,4,6,8,10]:
    print(i, i+1)
```

   (b) What is the output of the following:

```
end = 0
ans = 0
for j in range(20,end,-5):
    ans = ans + j
    print(j)
print(ans)
```

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

6. Write Python code that will:

    (a) Add the even numbers from 1966 to 2012 inclusive

    (b) Print the multiples of 11 from 44 to 770 inclusive

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

```
from graphics import *
def main():
    win = GraphWin("What's displayed?")
    win.setCoords(0.0, 0.0, 10.0, 10.0)
    p1 = Point(1,3)
    p2 = Point(7,7)
    p3 = Point(4,5)
    o = Oval(p1,p2)
    c = Circle(p3,2)
    l = Line(p1,p2)
    o.draw(win)
    c.draw(win)
    l.draw(win)
    win.getMouse()
    win.close()
```

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

```
l = 10
k = 1
for i in range(0,5):
    n = l - k
    print(l)
    l = k
    k = n
```

(b) What is the output of the following:

```
total = 5
s = -1
for i in range(2,7):
    s = -s
    total = total + s*i
    print(total)
```

9. Write a **complete** graphics-based program that requires the user to click on two points in its window. The program then draws the axis aligned oval for which those two points are in opposing corners, along with circles (of radius 5) at both points clicked.

10. Write a **complete** program that asks the user the number of items they plan to purchase at the bookstore. Your program should then ask the price of each book 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)

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
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setFill(color)
setOutline(color)
setWidth(pixels)
draw(aGraphWin)
undraw()
move(dx,dy)
clone()
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Text Methods
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Line(point1, point2)
setArrow(string)
getCenter()
getP1(), getP2()
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Circle Methods
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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()
```