

## Decision and While Loop Solutions

1.

- a) False
- b) Error
- c) True
- d) Error, unless numpy is imported; if numpy is imported then False.
- e) Error
- f) True
- g) True

2.

```
n = int(raw_input("Enter a positive integer: "))
if n%2 == 0:
    print n**2
elif n%2 == 1:
    print n**3
```

3.

```
n1 = int(raw_input("Enter a positive integer: "))
n2 = int(raw_input("Enter another positive integer: "))
if n1 % n2 == 0 or n2 % n1 == 0:
    print 'yes'
else:
    print 'no'
```

4.

```
num = int(raw_input('Please enter a number: '))
if num%2 == 1:
    print 'Your number is odd.'
if num%2 == 0:
    print 'Your number is even.'
if num > 100:
    print 'Your number is greater than 100.'
if num < 100:
    print 'Your number is less than 100.'
if num == 0:
    print 'Your number is 0.'
if num != 0:
    print 'Your number is not equal to 0.'
if num < 0:
    print 'Your number is negative.'
if num > 0:
    print 'Your number is positive.'
```

5.

```
#one example of an infinite loop
little = 0
```

```
big = 100
while little < big:
    little -= 1
print little
```

6.

```
num = int(raw_input('Please enter a number. In interger form.'))
unit = raw_input('Please enter starting unit.')
if unit == 'lb':
    new_num = 0.45359237 * num
    print num, unit, 'is', new_num, 'kg'
elif unit == 'kg':
    new_num = 2.20462262 * num
    print num, unit, 'is', new_num, 'lb'
else:
    print 'Incompatible units'
#for the extra work portion of the question simply add more if
statements to account for multiple
```

7.

```
num_1 = 54
num_2 = 92
got_it = False
while got_it == False:
    guess1 = int(raw_input('Enter an integer : '))
    guess2 = int(raw_input('Enter a second integer : '))
    if guess1 < num_1:
        print 'A number is higher than that. Try again.'
    elif guess2 < num_2:
        print 'A number is higher than that. Try again.'
    elif guess1 > num_1:
        print 'A number is lower than that. Try again.'
    elif guess2 > num_2:
        print 'A number is lower than that. Try again.'
    if num_1 == guess1 and num_2 == guess2:
        print('Congratulations, you guessed it.')
        print('(but you do not win any prizes!)')
        got_it = True
print 'Done'
```

8.

```
initial = 0
while initial != 25:
    print initial
    initial += 1
while initial >= 0:
    print initial
    initial -=1
```

9.

```
def sum(a, b):
    sum = 0
    for i in range(a, b + 1):
        sum += i**2
    return sum
```

10.

```
def triangle(a, b, c):
    return a**2 + b**2 == c**2 or a**2 + c**2 == b**2 or b**2 + c**2
== a**2
```

11.

a.

```
def factorial(n):
    fact = 1
    for i in range(1, n + 1):
        fact *= i
    return fact
```

b.

```
def compute_e(n):
    sum = 0
    for i in range(0, n):
        sum += 1.0/factorial(i)
    return sum
```