In [1]:
```
import numpy as np
```

In [2]:
```
ones_arr=np.ones((3,3))
```

In [3]:
```
ones_arr
```

Out[3]:
```
array([[1., 1., 1.],
       [1., 1., 1.],
       [1., 1., 1.]])
```

In [4]:
```
ones_arr=np.ones((5,5))
```

In [5]:
```
ones_arr
```

Out[5]:
```
array([[1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1.]])
```

In [6]:
```
ones_arr=np.ones((5,5),dtype=int)
```

In [7]:
```
ones_arr
```

Out[7]:
```
array([[1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1]])
```

In [8]:
```
ones_arr*255
```

Out[8]:
```
array([[255, 255, 255, 255, 255],
       [255, 255, 255, 255, 255],
       [255, 255, 255, 255, 255],
       [255, 255, 255, 255, 255],
       [255, 255, 255, 255, 255]])
```

In [9]:
```
import matplotlib.pyplot as plt
```

In [10]:
```
%matplotlib inline
```

In [11]:
```
from PIL import Image #python imaging library
```

In [12]:
```
horse_img=Image.open(r'C:\Users\arati\Downloads\horse.Jpeg')
```

In [13]:
```
horse_img
```

Out[13]:

In [14]:
```
type(horse_img)
```

Out[14]:
```
PIL.JpegImagePlugin.JpegImageFile
```

In [15]:
```
horse_arr=np.asarray(horse_img) #asarray--convert image to array
```

In [16]:
```
horse_arr
```

Out[16]:
```
array([[[13, 98, 77],
        [ 7, 90, 70],
        [ 0, 79, 60],
        ...,
        [ 1, 55, 42],
        [ 7, 61, 48],
        [ 7, 61, 48]],

       [[ 5, 88, 68],
        [ 1, 84, 64],
        [ 0, 77, 58],
        ...,
        [ 1, 55, 42],
        [ 6, 60, 47],
        [ 6, 60, 47]],

       [[ 0, 80, 61],
        [ 1, 80, 61],
        [ 0, 76, 58],
        ...,
        [ 0, 54, 41],
        [ 5, 59, 46],
        [ 5, 59, 46]],

       ...,

       [[31, 57, 20],
        [13, 36, 10],
        [ 8, 24, 14],
        ...,
        [ 8, 31, 13],
        [ 0, 11,  0],
        [10, 26, 23]],

       [[50, 76, 39],
        [22, 45, 19],
        [10, 26, 16],
        ...,
        [ 3, 26,  8],
        [20, 40, 28],
        [48, 64, 61]],

       [[62, 88, 53],
        [27, 50, 24],
        [ 9, 25, 15],
        ...,
        [ 1, 24,  6],
        [ 5, 25, 14],
        [40, 56, 53]]], dtype=uint8)
```

In [17]:
```
type(horse_arr)
```

Out[17]:
```
numpy.ndarray
```

In [18]:
```
horse_arr.shape
```

Out[18]:
```
(421, 474, 3)
```

In [19]:
```
plt.imshow(horse_arr)
#The imshow() function in pyplot module of matplotlib library is used to display
```

Out[19]:
```
<matplotlib.image.AxesImage at 0x1e818760590>
```

In [20]:
```
horse_red=horse_arr.copy()
```

In [21]:
```
horse_red
```

Out[21]:
```
array([[[13, 98, 77],
        [ 7, 90, 70],
        [ 0, 79, 60],
        ...,
        [ 1, 55, 42],
        [ 7, 61, 48],
        [ 7, 61, 48]],

       [[ 5, 88, 68],
        [ 1, 84, 64],
        [ 0, 77, 58],
        ...,
        [ 1, 55, 42],
        [ 6, 60, 47],
        [ 6, 60, 47]],

       [[ 0, 80, 61],
        [ 1, 80, 61],
        [ 0, 76, 58],
        ...,
        [ 0, 54, 41],
        [ 5, 59, 46],
        [ 5, 59, 46]],

       ...,

       [[31, 57, 20],
        [13, 36, 10],
        [ 8, 24, 14],
        ...,
        [ 8, 31, 13],
        [ 0, 11,  0],
        [10, 26, 23]],

       [[50, 76, 39],
        [22, 45, 19],
        [10, 26, 16],
        ...,
        [ 3, 26,  8],
        [20, 40, 28],
        [48, 64, 61]],

       [[62, 88, 53],
        [27, 50, 24],
        [ 9, 25, 15],
        ...,
        [ 1, 24,  6],
        [ 5, 25, 14],
        [40, 56, 53]]], dtype=uint8)
```

In [22]:
```
horse_arr==horse_red
```

Out[22]:
```
array([[[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       ...,

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]]])
```

In [23]:
```
plt.imshow(horse_red)
```

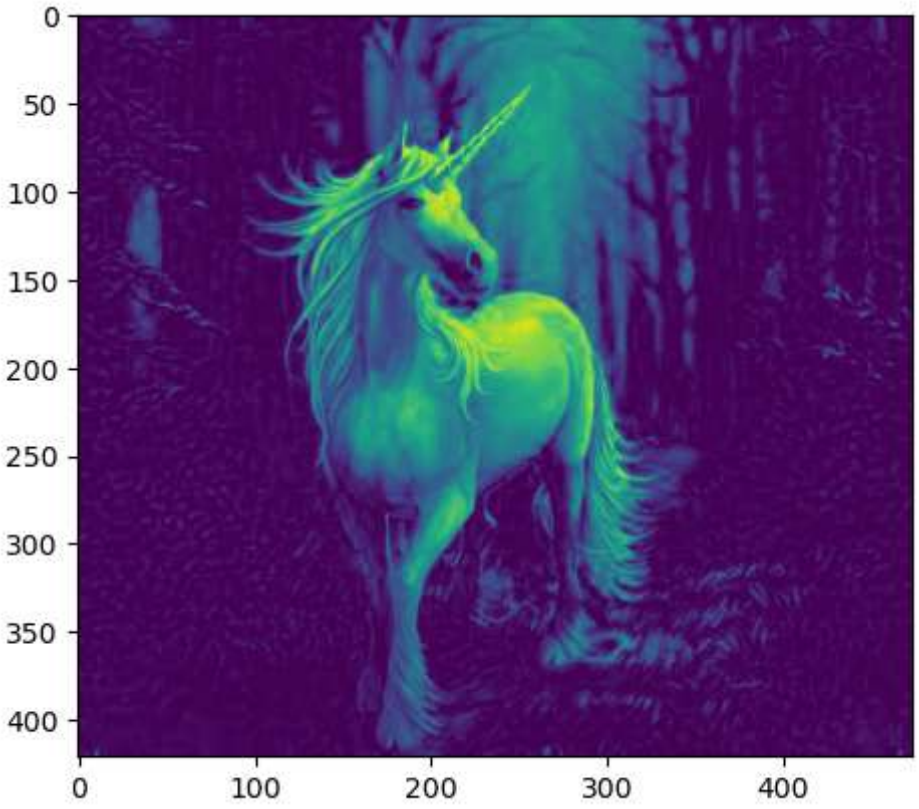
Out[23]:
```
<matplotlib.image.AxesImage at 0x1e8197f3350>
```

In [24]:
```
horse_red.shape
```

Out[24]:
```
(421, 474, 3)
```

In [25]:
```
#R G B
plt.imshow(horse_red[:,:,0])
```

Out[25]:
```
<matplotlib.image.AxesImage at 0x1e819879940>
```

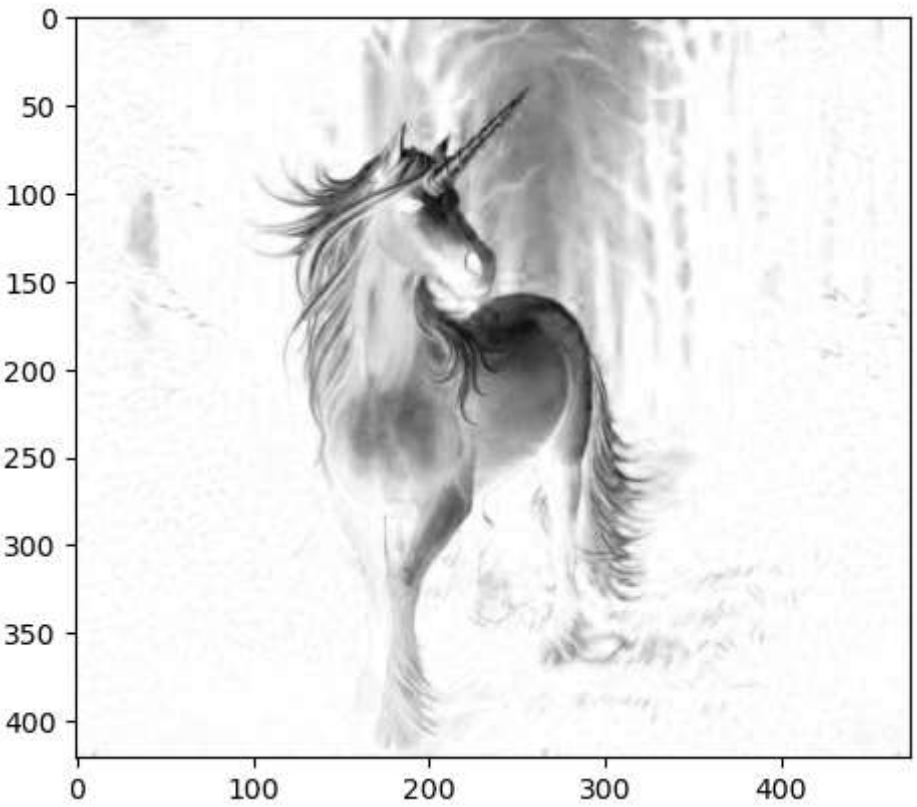


In [26]:
```
horse_red[:,:,0]
```

Out[26]:
```
array([[13,  7,  0, ...,  1,  7,  7],
       [ 5,  1,  0, ...,  1,  6,  6],
       [ 0,  1,  0, ...,  0,  5,  5],
       ...,
       [31, 13,  8, ...,  8,  0, 10],
       [50, 22, 10, ...,  3, 20, 48],
       [62, 27,  9, ...,  1,  5, 40]], dtype=uint8)
```

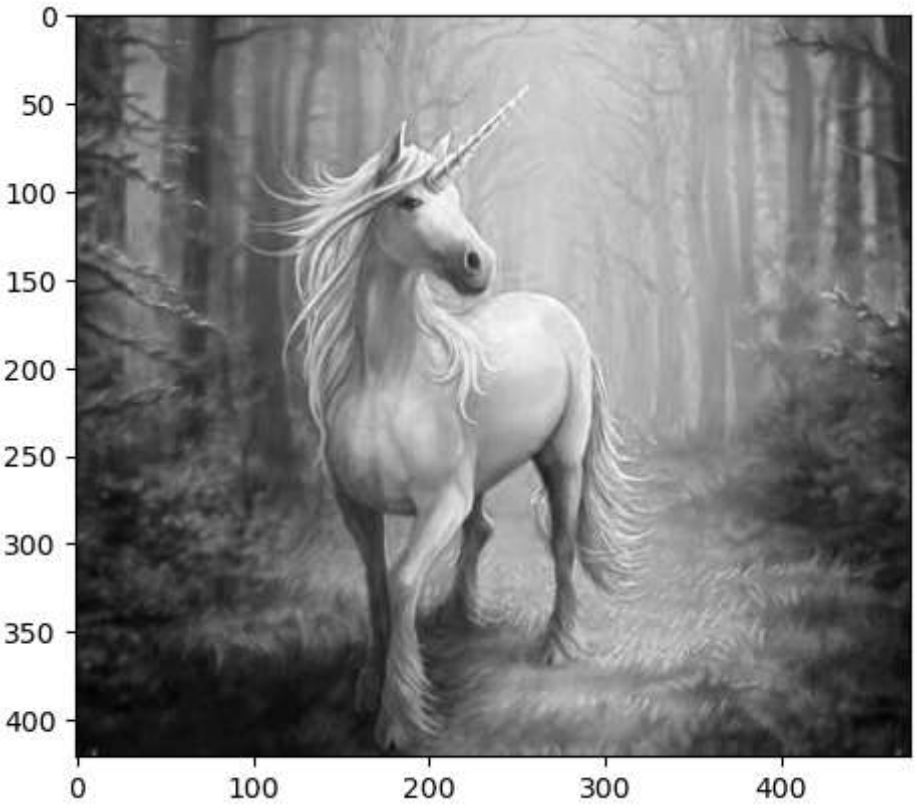
In [27]:
```
plt.imshow(horse_red[:,:,0], cmap='Greys')
```

Out[27]:
```
<matplotlib.image.AxesImage at 0x1e8198c53d0>
```



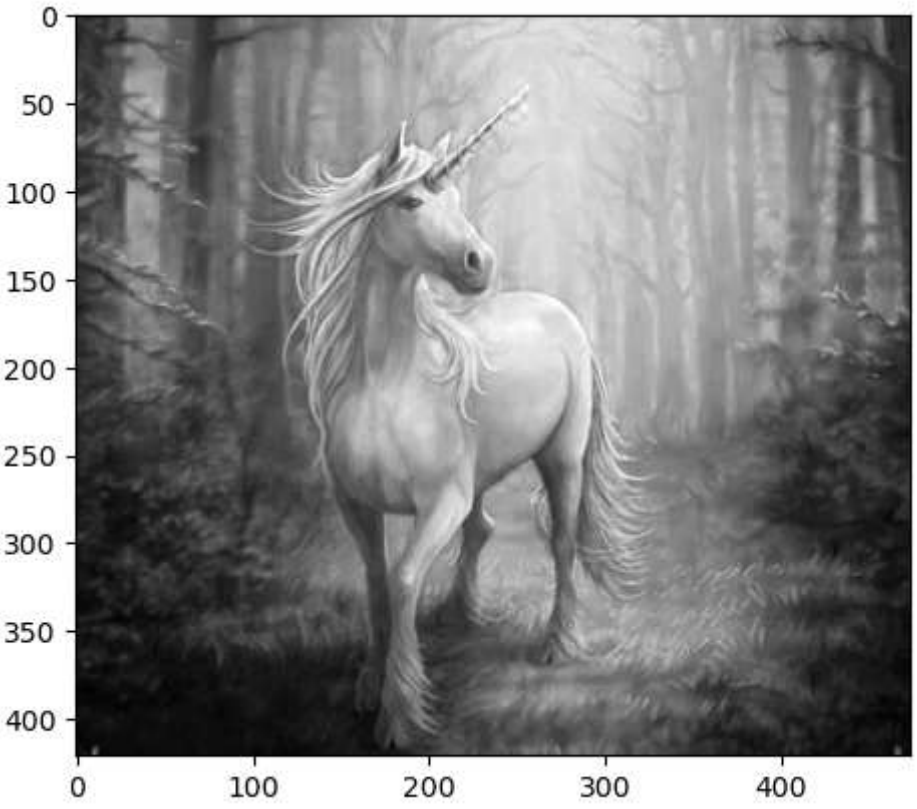
In [28]:
```
plt.imshow(horse_red[:,:,1],cmap='grey')
```

Out[28]:
```
<matplotlib.image.AxesImage at 0x1e81993ad80>
```



In [29]:
```
plt.imshow(horse_red[:,:,2],cmap='grey')
```

Out[29]: <matplotlib.image.AxesImage at 0x1e8199953d0>



In [30]:
```
horse_red[:,:,0]
```

Out[30]:
```
array([[13,  7,  0, ...,  1,  7,  7],
       [ 5,  1,  0, ...,  1,  6,  6],
       [ 0,  1,  0, ...,  0,  5,  5],
       ...,
       [31, 13,  8, ...,  8,  0, 10],
       [50, 22, 10, ...,  3, 20, 48],
       [62, 27,  9, ...,  1,  5, 40]], dtype=uint8)
```

In [31]:
```
horse_red[:,:,1]
```

Out[31]:
```
array([[98, 90, 79, ..., 55, 61, 61],
       [88, 84, 77, ..., 55, 60, 60],
       [80, 80, 76, ..., 54, 59, 59],
       ...,
       [57, 36, 24, ..., 31, 11, 26],
       [76, 45, 26, ..., 26, 40, 64],
       [88, 50, 25, ..., 24, 25, 56]], dtype=uint8)
```

In [32]:
```
horse_red[:,:,2]
```

Out[32]:
```
array([[77, 70, 60, ..., 42, 48, 48],
       [68, 64, 58, ..., 42, 47, 47],
       [61, 61, 58, ..., 41, 46, 46],
       ...,
       [20, 10, 14, ..., 13,  0, 23],
       [39, 19, 16, ...,  8, 28, 61],
       [53, 24, 15, ...,  6, 14, 53]], dtype=uint8)
```

In [33]:
```
horse_red[:,:,1]=0
```

In [34]:
```
horse_red
```

Out[34]:
```
array([[[13,  0, 77],
        [ 7,  0, 70],
        [ 0,  0, 60],
        ...,
        [ 1,  0, 42],
        [ 7,  0, 48],
        [ 7,  0, 48]],

       [[ 5,  0, 68],
        [ 1,  0, 64],
        [ 0,  0, 58],
        ...,
        [ 1,  0, 42],
        [ 6,  0, 47],
        [ 6,  0, 47]],

       [[ 0,  0, 61],
        [ 1,  0, 61],
        [ 0,  0, 58],
        ...,
        [ 0,  0, 41],
        [ 5,  0, 46],
        [ 5,  0, 46]],

       ...,

       [[31,  0, 20],
        [13,  0, 10],
        [ 8,  0, 14],
        ...,
        [ 8,  0, 13],
        [ 0,  0,  0],
        [10,  0, 23]],

       [[50,  0, 39],
        [22,  0, 19],
        [10,  0, 16],
        ...,
        [ 3,  0,  8],
        [20,  0, 28],
        [48,  0, 61]],

       [[62,  0, 53],
        [27,  0, 24],
        [ 9,  0, 15],
        ...,
        [ 1,  0,  6],
        [ 5,  0, 14],
        [40,  0, 53]]], dtype=uint8)
```

In [35]:
```
plt.imshow(horse_red)
```

Out[35]:
```
<matplotlib.image.AxesImage at 0x1e81a216ba0>
```

In [36]:
```
horse_red[:,:,1]
```

Out[36]:
```
array([[0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       ...,
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

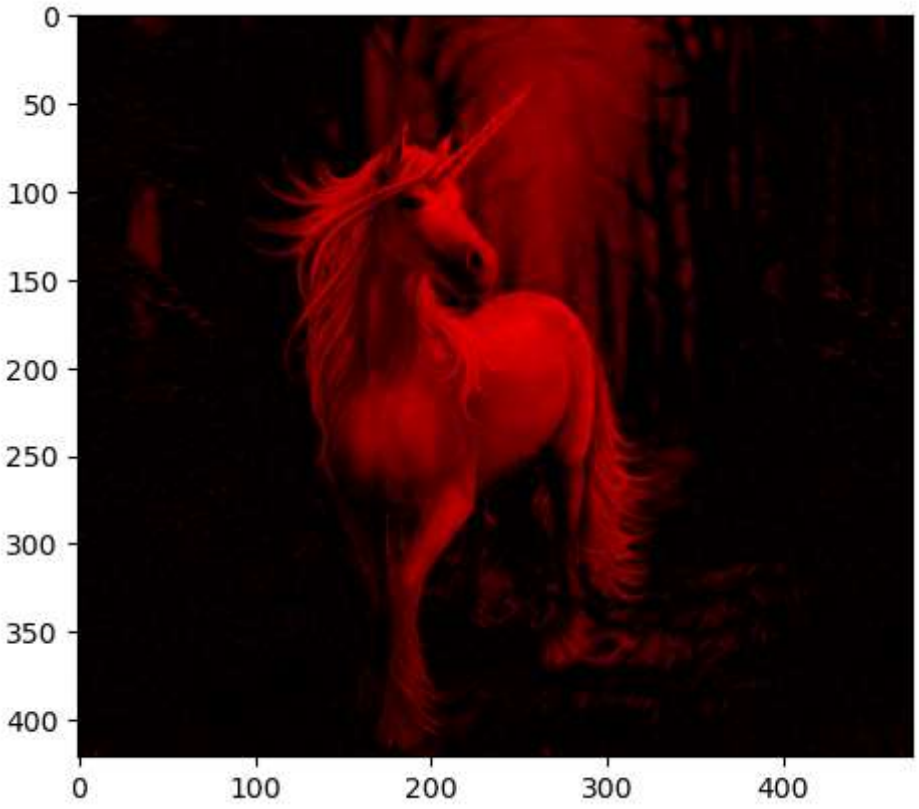
In [38]:
```
horse_red[:,:,2]=0
```

In [39]:
```
horse_red
```

Out[39]:
```
array([[[13,  0,  0],
        [ 7,  0,  0],
        [ 0,  0,  0],
        ...,
        [ 1,  0,  0],
        [ 7,  0,  0],
        [ 7,  0,  0]],

       [[ 5,  0,  0],
        [ 1,  0,  0],
        [ 0,  0,  0],
        ...,
        [ 1,  0,  0],
        [ 6,  0,  0],
        [ 6,  0,  0]],

       [[ 0,  0,  0],
        [ 1,  0,  0],
        [ 0,  0,  0],
        ...,
        [ 0,  0,  0],
        [ 5,  0,  0],
        [ 5,  0,  0]],

       ...,

       [[31,  0,  0],
        [13,  0,  0],
        [ 8,  0,  0],
        ...,
        [ 8,  0,  0],
        [ 0,  0,  0],
        [10,  0,  0]],

       [[50,  0,  0],
        [22,  0,  0],
        [10,  0,  0],
        ...,
        [ 3,  0,  0],
        [20,  0,  0],
        [48,  0,  0]],

       [[62,  0,  0],
        [27,  0,  0],
        [ 9,  0,  0],
        ...,
        [ 1,  0,  0],
        [ 5,  0,  0],
        [40,  0,  0]]], dtype=uint8)
```

In [40]:
```
plt.imshow(horse_red)
```

Out[40]:
```
<matplotlib.image.AxesImage at 0x1e81a2c7800>
```



In [41]:
```
horse_red[:,:,2]
```

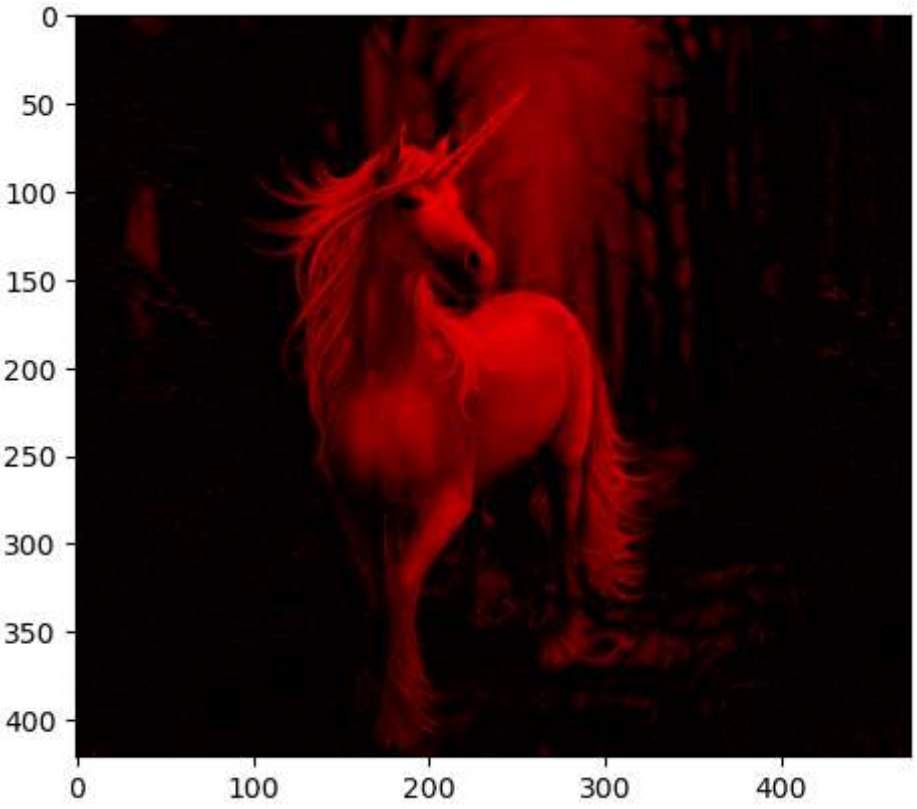
Out[41]:
```
array([[0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       ...,
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

In [42]:
```
horse_arr
```

Out[42]:
```
array([[[13, 98, 77],
        [ 7, 90, 70],
        [ 0, 79, 60],
        ...,
        [ 1, 55, 42],
        [ 7, 61, 48],
        [ 7, 61, 48]],

       [[ 5, 88, 68],
        [ 1, 84, 64],
        [ 0, 77, 58],
        ...,
        [ 1, 55, 42],
        [ 6, 60, 47],
        [ 6, 60, 47]],

       [[ 0, 80, 61],
        [ 1, 80, 61],
        [ 0, 76, 58],
        ...,
        [ 0, 54, 41],
        [ 5, 59, 46],
        [ 5, 59, 46]],

       ...,

       [[31, 57, 20],
        [13, 36, 10],
        [ 8, 24, 14],
        ...,
        [ 8, 31, 13],
        [ 0, 11,  0],
        [10, 26, 23]],

       [[50, 76, 39],
        [22, 45, 19],
        [10, 26, 16],
        ...,
        [ 3, 26,  8],
        [20, 40, 28],
        [48, 64, 61]],

       [[62, 88, 53],
        [27, 50, 24],
        [ 9, 25, 15],
        ...,
        [ 1, 24,  6],
        [ 5, 25, 14],
        [40, 56, 53]]], dtype=uint8)
```

In [43]:
```
plt.imshow(horse_red)
```

Out[43]:
```
<matplotlib.image.AxesImage at 0x1e8199536e0>
```



In [44]:
```
horse_img
```

Out[44]:

In [45]:
```
arr1=np.asarray(horse_img)
```

In [46]:
```
arr1
```

Out[46]:
```
array([[[13, 98, 77],
        [ 7, 90, 70],
        [ 0, 79, 60],
        ...,
        [ 1, 55, 42],
        [ 7, 61, 48],
        [ 7, 61, 48]],

       [[ 5, 88, 68],
        [ 1, 84, 64],
        [ 0, 77, 58],
        ...,
        [ 1, 55, 42],
        [ 6, 60, 47],
        [ 6, 60, 47]],

       [[ 0, 80, 61],
        [ 1, 80, 61],
        [ 0, 76, 58],
        ...,
        [ 0, 54, 41],
        [ 5, 59, 46],
        [ 5, 59, 46]],

       ...,

       [[31, 57, 20],
        [13, 36, 10],
        [ 8, 24, 14],
        ...,
        [ 8, 31, 13],
        [ 0, 11,  0],
        [10, 26, 23]],

       [[50, 76, 39],
        [22, 45, 19],
        [10, 26, 16],
        ...,
        [ 3, 26,  8],
        [20, 40, 28],
        [48, 64, 61]],

       [[62, 88, 53],
        [27, 50, 24],
        [ 9, 25, 15],
        ...,
        [ 1, 24,  6],
        [ 5, 25, 14],
        [40, 56, 53]]], dtype=uint8)
```

In [47]:
```
type(arr1)
```

Out[47]:
```
numpy.ndarray
```

In [48]:
```
arr1.shape
```

Out[48]:
```
(421, 474, 3)
```

In [49]:
```
plt.imshow(arr1)
```

Out[49]: <matplotlib.image.AxesImage at 0x1e81a2b01d0>

In [69]:
```
horse_img1=arr1.copy()
```

In [70]:
```
horse_img1[:,:,0]=0
```

In [71]:
```
horse_img1
```

Out[71]:
```
array([[[ 0, 98, 77],
        [ 0, 90, 70],
        [ 0, 79, 60],
        ...,
        [ 0, 55, 42],
        [ 0, 61, 48],
        [ 0, 61, 48]],

       [[ 0, 88, 68],
        [ 0, 84, 64],
        [ 0, 77, 58],
        ...,
        [ 0, 55, 42],
        [ 0, 60, 47],
        [ 0, 60, 47]],

       [[ 0, 80, 61],
        [ 0, 80, 61],
        [ 0, 76, 58],
        ...,
        [ 0, 54, 41],
        [ 0, 59, 46],
        [ 0, 59, 46]],

       ...,

       [[ 0, 57, 20],
        [ 0, 36, 10],
        [ 0, 24, 14],
        ...,
        [ 0, 31, 13],
        [ 0, 11,  0],
        [ 0, 26, 23]],

       [[ 0, 76, 39],
        [ 0, 45, 19],
        [ 0, 26, 16],
        ...,
        [ 0, 26,  8],
        [ 0, 40, 28],
        [ 0, 64, 61]],

       [[ 0, 88, 53],
        [ 0, 50, 24],
        [ 0, 25, 15],
        ...,
        [ 0, 24,  6],
        [ 0, 25, 14],
        [ 0, 56, 53]]], dtype=uint8)
```

In [72]:
```
arr1.shape
```

Out[72]:
```
(421, 474, 3)
```

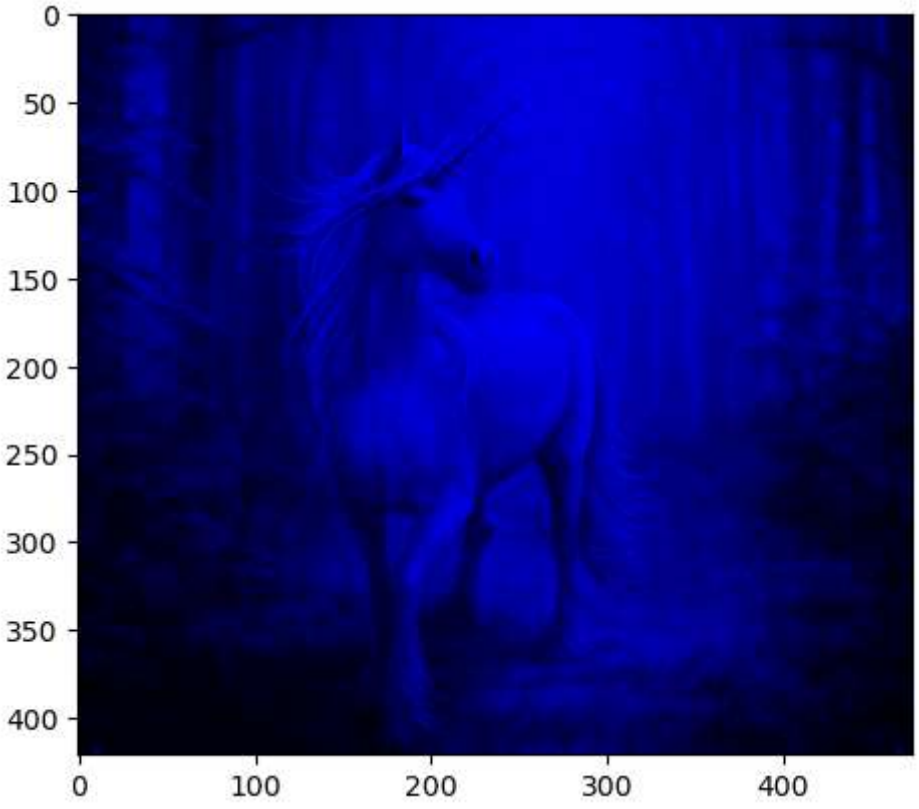
In [73]:
```
plt.imshow(horse_img1)
```

Out[73]:
```
<matplotlib.image.AxesImage at 0x1e8187601a0>
```

In [75]:
```
horse_img1[:,:,1]=0
```

In [76]:
```
plt.imshow(horse_img1)
```

Out[76]:
```
<matplotlib.image.AxesImage at 0x1e81a2402c0>
```



In [55]:
```
arr1.shape
```

Out[55]: (421, 474, 3)

In [56]:
```
plt.imshow(arr1)
```

Out[56]: <matplotlib.image.AxesImage at 0x1e81a097f50>

In [60]:
```
horse_img1[:,:,1]
```

Out[60]:
```
array([[0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       ...,
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

In [61]:
```
horse_img1[:,:,0] = 0
```

In [62]:
```
plt.imshow(horse_img1)
```

Out[62]: <matplotlib.image.AxesImage at 0x1e81b5fac30>


0
50
100
150
200
250
300
350
400
0
100
200
300
400