

Your name:

Homework1.10: Word Problems and Graphics and Exponents, September 12, 2021

1. Make a line plot of $y = 10^x$, for different values of x . The first step is to figure out $10^1, 10^2, 10^3, 10^{-1}, 10^{-2}, 10^{-3}$, which will be easy for you by now. The next step is to insert those values into the following line plot Python code, along with 1, 2, 3, -1, -2, -3. Note that I've left out $x = 0$. Suppose you didn't know that $10^0 = 1$. What would you conclude would be a good estimate for 10^0 ?

```
import matplotlib.pyplot as plt;

x = [2001,2002,2333,2114]
y = [100,8000,4000,80000]

plt.plot(x, y, linestyle="solid", marker= "o")

plt.xlabel("x")
plt.ylabel("y")
plt.title("y = 10 to the x'th power")
    # Set x, y limits for the points covered by the diagram:
plt.xlim(-4,4)
plt.ylim(0, 1100)

plt.show()
```

Print out your graph and code and turn it in by email or in hardcopy.

2. Make a line plot of $y = 2^x$. The first step is to figure out $2^1, 2^2, 2^3, 2^{-1}, 2^{-2}, 2^{-3}$, which will be easy for you by now. The next step is to insert those values into the following line plot Python code, along with 1, 2, 3, -1, -2, -3. Note that I've left out $x = 0$. Suppose you didn't know that $2^0 = 1$. What would you conclude would be a good estimate for 2^0 ?

Use the same code as before, with new numbers, but also change the ylim to (0, 9). Change the title to: "y = 2 to the x'th power".

Print out your graph and code and turn it in by email or in hardcopy.

3. A small holster-making company owes \$40,000 to the bank. To make a holster for the new Glock 1600 automatic pistol, it needs to buy 100 pieces of plastic at \$12 each, two new cutting machines at \$3,254 each, and pay 3 workers \$12/hour for 40 hours of work for each worker. It expects to make and sell 1,000 holsters at \$50/holster. The mother of the company's owner must pay \$34,000 for a gall bladder operation.

- What is the total cost of making the 1,000 holsters?
- What is the expected profit?