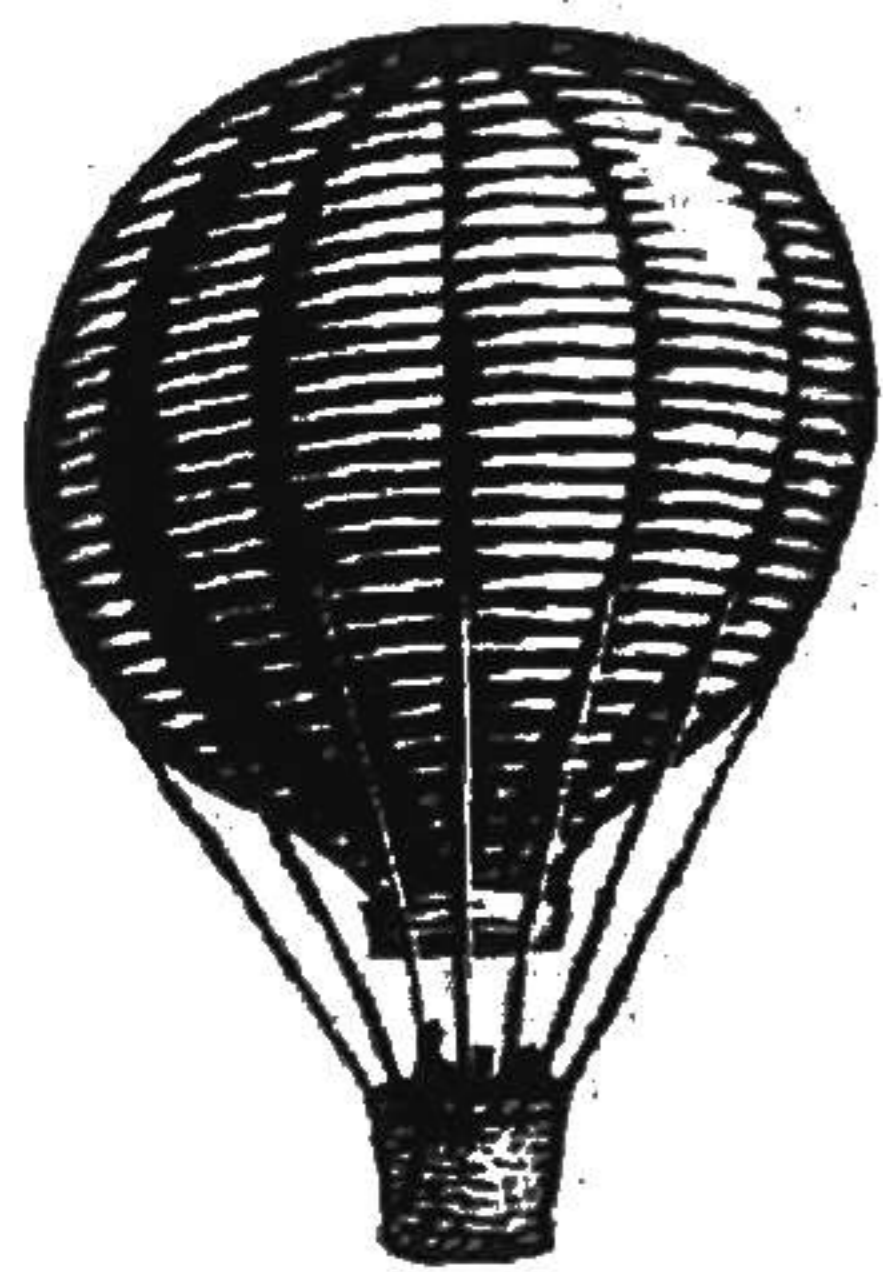
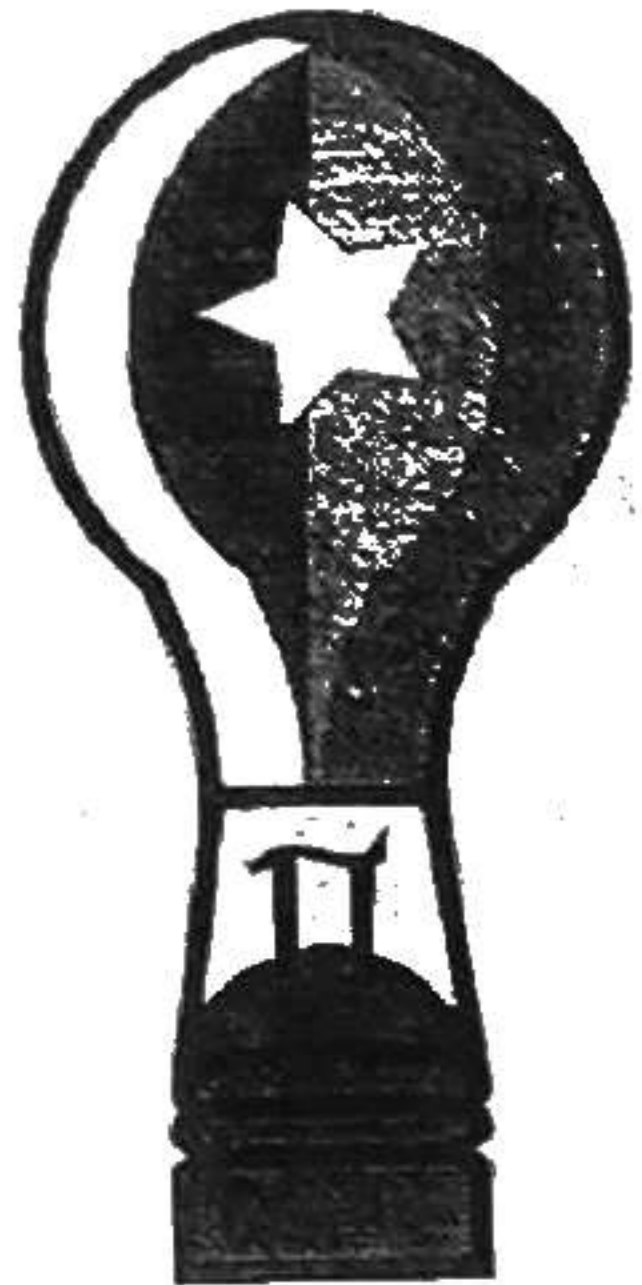
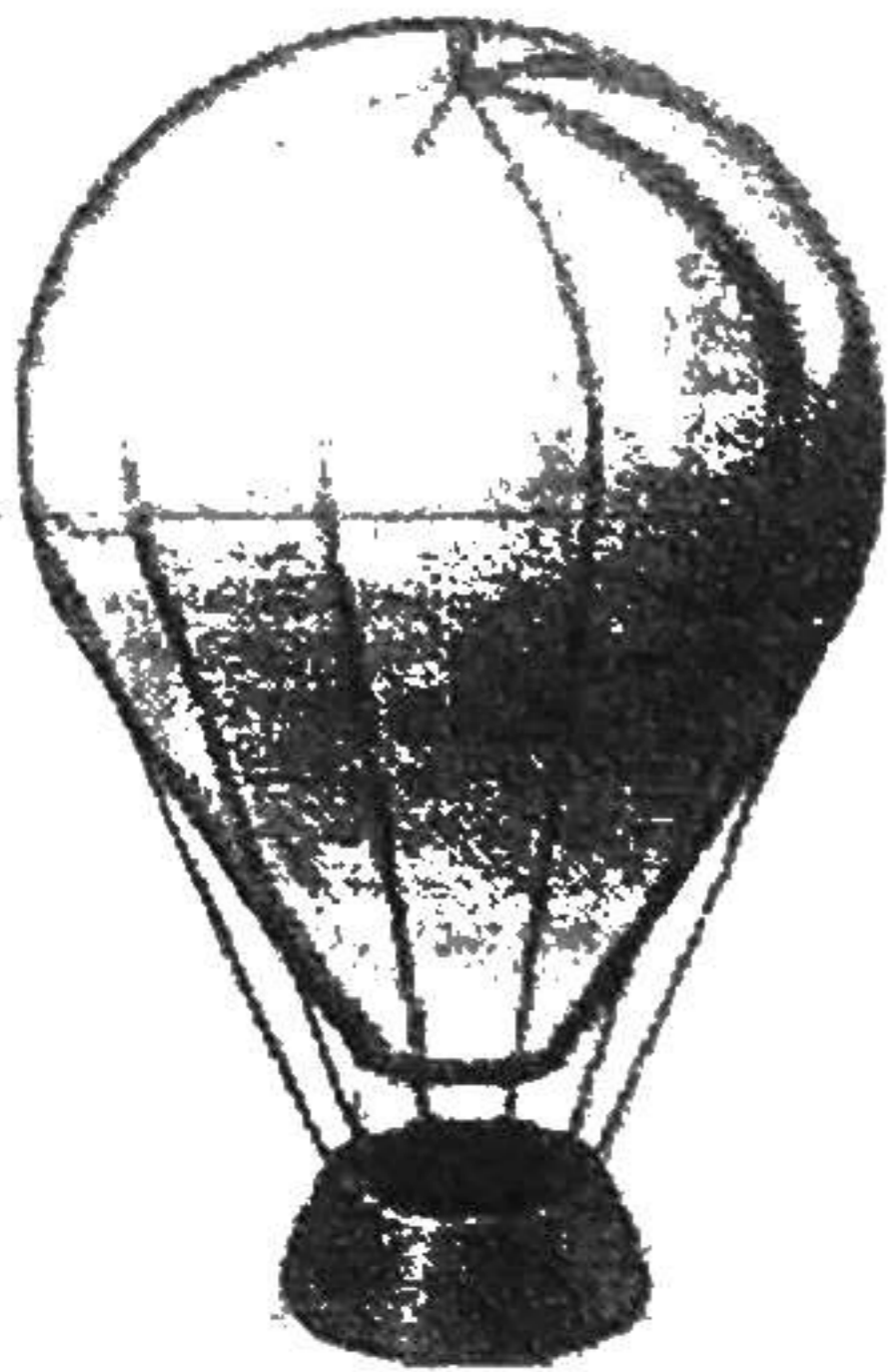
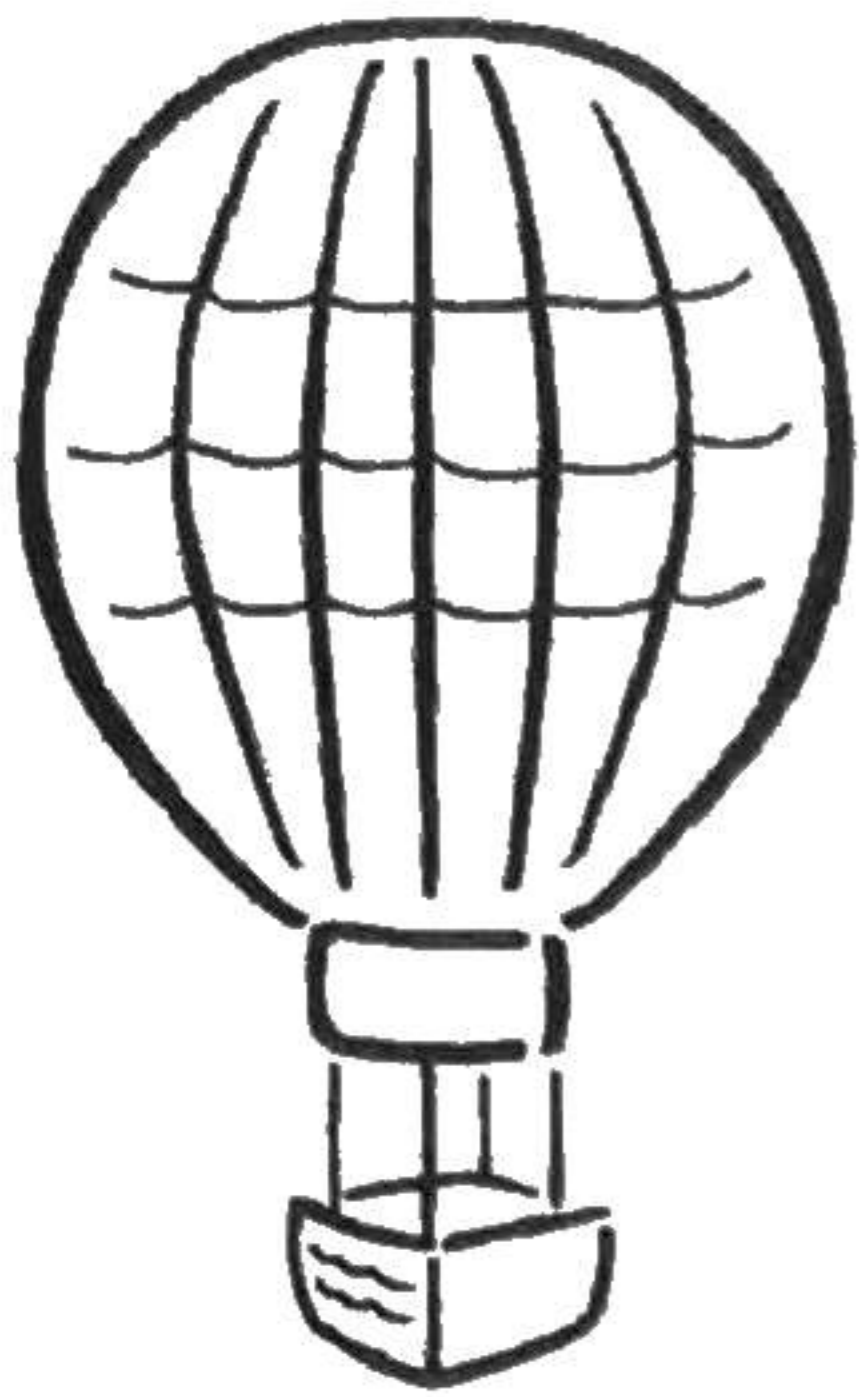


Hot-Air Balloon Project (Quiz #2)

Answer all questions fully with complete explanations and showing all work necessary to determine the function rule $A(t) = mt + b$ for each Hot Air Balloon below, you must have:

- 1) Lines, correctly graphed, representing the path of all five balloons
- 2) An outline balloon for each of the five balloons with the: a) function rule, b) slope, c) domain/range, d) y - int. and e) x - int. written on the balloon
- 3) Complete answers to the additional questions (**bolded questions**) on a separate piece of paper.



At the Texas Balloon Festival, a hot-air balloon - *Balloon Alpha1* - is first sighted at an altitude of 800 feet and appears to be descending at a constant rate of 20 feet per minute. Spectators are wondering how the altitude of the *Balloon Alpha1* is changing as time passes. The altitude, A , of the balloon in feet is a function of the time, t , in minutes starting when the balloon was first sighted.

1. How long does it take *Alpha1* to reach an altitude of 20 feet? How long does it take the balloon to land?
 - Make a table of values to show *Balloon Alpha1's* altitude every 5 minutes beginning at 5 minutes before the balloon was sighted until the balloon lands.
2. A second balloon - *Balloon Bowie2* - is first sighted at an altitude 25% lower than *Alpha1* and descending at a rate 50% slower than *Alpha1*. **Describe the TRANSFORMATIONS from *Alpha1* to *Bowie2* using the transformation vocabulary from our last lesson?** (rotation, vertical translation, reflection, etc.)
3. A third balloon - *Balloon Epic3* - is known to be at an altitude of 350 feet after descending for 16 minutes and then at an altitude of 150 feet after descending for 24 minutes. **Show the process needed to determine the function rule. How does the descent and landing time of the *Balloon Epic3* compare with that of the *Balloon Alpha1* and *Balloon Bowie2*?** Explain what this means graphically for each situation?
4. At the instant the first balloon is sighted, a fourth balloon - *Balloon Dawgs4* - is launched from the ground rising at a rate of 30 feet per minute. **When will *Balloon Alpha1* and *Balloon Dawgs4* be at the same altitude? What is that altitude? When will *Balloon Bowie2* and *Balloon Dawgs4* be at the same altitude? Explain why this models a Direct Variation and what is the constant of the variation?**
5. A fifth balloon - *Balloon Omega5* - is descending at a rate of 30 feet per minute. It is at an altitude of 510 feet after 13 minutes into its descent. **How does the descent and landing time of *Balloon Omega5* compare to that of all the other four balloons?**
6. **Which balloon was travelling the slowest? Which balloon began at the highest elevation? Are any balloons travelling a parallel path and explain how you know? What is the altitude of each balloon at 22 minutes from when first sighted?**

Hot Air Balloon Project Graphs: Make sure your graphs are accurate using a ruler, label each balloon path, use appropriate x and y scales, label each axis correctly, etc. Bad graphs = Bad grades!

