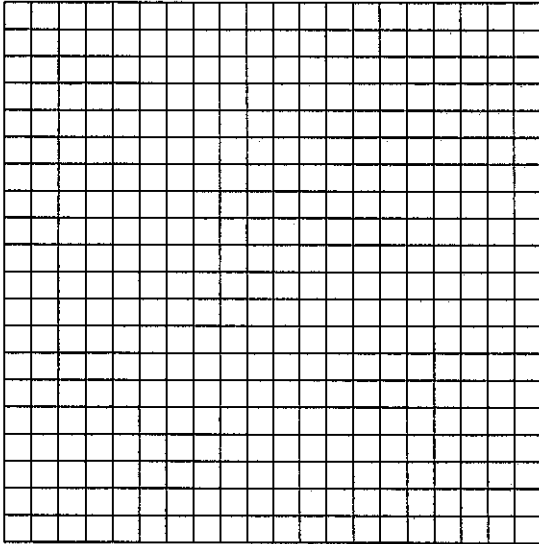


U11L1A Exponential vs. Linear, Quadratic

Name: _____

Date: _____

1. Graph the functions $f(x) = 3x + 7$ and $g(x) = (\frac{7}{4})^x - 3$, where $x \geq 2$. Which point is closest to where $g(x)$ begins to exceed $f(x)$?



- A. $x = 7$ B. $x = 6$ C. $x = 4$ D. $x = 9$

2. The growth of Company A is described by the function $h(x) = 2^x$. The growth of Company B is described by the function $s(x) = x^2$. The variable x describes the number of years the company has been in business. Compare the growth of the two companies over time. Include where one is better than the other, where they are equal in growth, and any interesting comparisons. Which would you invest in for short term (first three years) gain? Long term gain?

3. Edna is inflating balloons for a graduation party. The balloons are 12 in in diameter and are full at 0.54 cubic feet.

Use a table to determine how long will it take to blow up the balloon versus using a helium tank. The different rates—in ft^3 per second—are approximated by the functions below.

Blow up: $b(t) = (\frac{t}{10})^3$

Helium: $h(t) = \frac{1}{2}(1.1^{0.3t})$

Time (s)	$b(t)$	$h(t)$
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

- A. blow up, between 3 and 4 seconds; helium, between 3 and 4 seconds
- B. blow up, between 5 and 6 seconds; helium, between 1 and 2 seconds
- C. blow up, between 7 and 8 seconds; helium, between 4 and 5 seconds
- D. blow up, between 8 and 9 seconds; helium, between 2 and 3 seconds

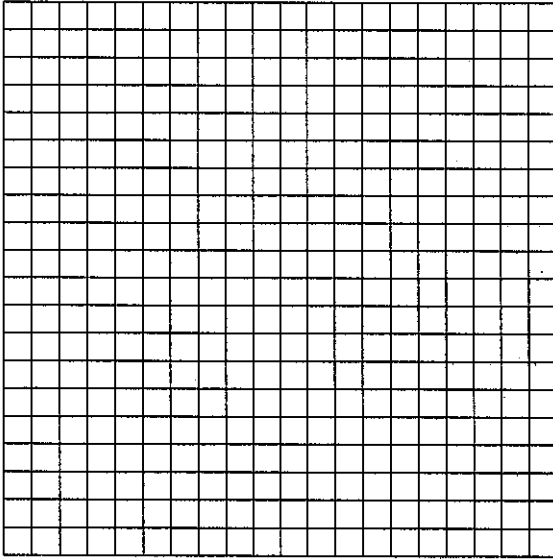
4. In two petri dishes, a sample of bacteria covers an area of 7 mm^2 . Each dish contains a different growth medium. The different growth rates—in mm^2 per day—are approximated by the functions:

Dish 1: $f(t) = 7 + \left(\frac{\pi}{2}\right)x^2$

Dish 2: $g(t) = 7 + \left(\frac{\pi}{2}\right)^{1.5x}$

Graph the results for the first 10 days.

On which day does the area in Dish 2 begin to exceed Dish 1?



A. Day 5

B. Day 6

C. Day 8

D. Day 9

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1.

Answer: B

Objective: F.LE.03

2.

Answer: Company A outperforms Company B until two years have passed. Company B outperforms Company A for the third and fourth years. After 4 years, Company A's performance rises very rapidly. For the first three years, there is little difference between the two; after four years, it would be better to invest in Company A.

Objective: F.LE.03

3.

Answer: D

Objective: F.LE.03

4.

Answer: B

Objective: F.LE.03