

## **The STAARS At Night**

The stars at night were big and bright, deep in the heart of Texas, until someone plucked them from the sky and locked them up. Can you solve the clues to release the stars back into the sky? Will you be the star of STAAR?

**Clue 1**

Go to page 1.3, and press enter to input your answers.

**clue1()**

## Problem 2

### **Clue 2**

The Remote Associates Test (RAT) is a creativity test used to determine a human's creative potential. Questions on the test consist of three common words that appear to be unrelated. The person being tested must think of a fourth word that is somehow related to each of the first three words. Your possible fourth words are the colors on page 2.2.

For example: Given "Fish, Mine, Rush", the fourth word is "Gold". You can have a goldfish, a gold mine, and a gold rush.

0 1 2 3 4

5 6 7 8 9

### Problem 3

#### **Clue 3**

Answer the questions on the following pages.

The graph of an **exponential function** is shown on the right.  
Which dashed line is an asymptote for the graph?

- ☐ D. **Line q**
- ☐ E. **Line r** ↓
- ☐ R. **Line s** ↓
- ☐ H. **Line t**



A particular type of cell doubles in number every hour. Which function can be used to find the number of cells present at the end of  $h$  hours if there are initially 4 of these cells?

☐ K.  $n=4\left(\frac{1}{2}\right)^h$

☐ A.  $n=4(2)^h$

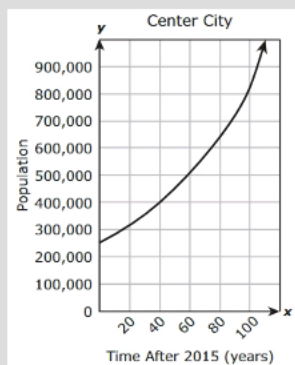
↓

☐ O.  $n=4+(2)^h$

↓

☐ N.  $n=4+\left(\frac{1}{2}\right)^h$

The population of Center City is modeled by exponential function  $f$ , where  $x$  is the number of years after the year 2015. The graph of  $f$  is shown below.



Which inequality best represents the range of  $f$  in this situation?

- ☐ U.  $x \geq 0$  ↓
- ☐ A.  $y \geq 250,000$  ↓
- ☐ R.  $0 \leq x \leq 110$  ↓
- ☐ T.  $250,000 \leq y \leq 1,000,000$

A student used  $f(x)=5.00(1.012)^x$  to show how the balance in a savings account will increase over time. What does the 5.00 represent?

- ☐ A. The interest the savings account earned for the first year.
- ☐ C. The annual interest rate of the savings account.  
↓
- ☐ E. The number of years the savings account has earned interest. ↓
- ☐ T. The starting balance of the savings account.

The amount of fertilizer in a landscaping company's warehouse decreases at a rate of 3% per week. The amount of fertilizer in the warehouse was originally 78,000 cubic yards. Which function models the amount of fertilizer in cubic yards left after  $w$  weeks?

- ☐ B.  $f(w) = 0.97(78,000)^w$
- ☐ M.  $f(w) = 1.03(78,000)^w$  ↓
- ☐ S.  $f(w) = 78,000(0.97)^w$  ↓
- ☐ L.  $f(w) = 78,000(1.03)^w$

#### Problem 4

##### **Clue 4**

Answer the question on the following page.

Which expression is equivalent to  $(7x^3)^2(x^8)^{1/2}$  ?

☐  $14x^{10}$

☐  $49x^{10}$

☐  $14x^7$

☐  $49x^7$

Problem 5

**Clue 5**

Which expressions are factors of  $6x^2+13x+5$  ?

Which expressions are factors of  $x^2-13x-30$  ?

Which expressions are factors of  $18x^2-15x+2$  ?

F $2x + 1$	M $2x + 5$	L $6x - 1$	M $x - 15$	O $9x - 1$
O $x - 3$	Y $3x - 2$	N $x + 15$	A $3x + 5$	I $x + 2$