Sum up the News – June 5th, 2017

Vocabulary

1. Both the slope and the y-values of a given function increases as the x-values increase. While the function has a y-intercept at (0, 4), it does not have an x-intercept. Which of the following words best describe the type of function?

  A. exponential

  B. inverse

  C. power

  D. quadratic

2. A right cone has a total volume of 80 cubic inches. If it has a radius of 5 inches, then what is its slant height?

  A. 5.1 inches

  B. 5.9 inches

  C. 10.8 inches

  D. 34.3 inches

3. A scatter plot is used to analyze the relationship between two variables, x and y. If x and y have a strong correlation, then which of the following values could be the R-value for the relationship?

  A. 0.56

  B. 0.15

  C. -0.80

  D. -1.52

Based on the article "Paul Allen's giant aircraft emerges for months of tests before a first flight" on page A1 of the Thursday, Jun 1st, Seattle Times.

4. Examine the graphic titled "Engineers call it the Roc". The central wingspan of the Stratolaunch is 120 feet wide and each of its two fuselages has a radius of 8 feet. What portion of the plane's wingspan lies to the outside of its fuselages?

      A. 52%

      B. 61%

      C. 65%

      D. 67%

5. Rockets launched from the ground have roughly 90% of their weight used for fuel. They are built in stages, and each stage needs to burn enough fuel to lift itself and the subsequent stages off the ground. By carrying the rocket up to a height of 35,000 before releasing it, the rocket can forgo having a third stage, eliminating 40% of the fuel needed to reach orbit for a given payload. If the Stratolaunch carries a rocket weighing 400,000 pounds into the air to launch, what payload could the rocket be carrying?

      A. 42,000 pounds

      B. 63,000 pounds

      C. 83,000 pounds

      D. 200,000 pounds

Based on the article "NASA spacecraft will aim straight for sun next year" on page A19 of the Thursday, June 1st, Seattle Times.

6. The Parker Solar Probe's mission will take it closer to the Sun than any other manmade object. The current record is held by the Helios 2 spacecraft which got within 27 million miles of the Sun's surface. The Parker probe will get 7 times closer and will travel at an average speed of 430,000 miles per hour as it zips and in and out of the extremely hot area near the sun. The probe will travel along a highly eccentric orbit to minimize the time near the Sun. For what minimum period of time will the probe be nearer to the Sun than the record distance set by Helios 2?

      A. 70 hours

      B. 110 hours

      C. 140 hours

      D. 190 hours

7. To prevent the heat of the sun from damaging its body, the probe has a large flat cylinder that acts as a heat shield. The shield is made from a carbon composite and 4.5inches thick with an 8-foot diameter. It will reach a temperature of roughly 1400° C, but the rest of the probe will only reach 30°C. What is the volume of the heat shield?

    A. 6 cubic feet

    B. 19 cubic feet

    C. 75 cubic feet

    D. 290 cubic feet

Based on the article "Old law could sink plans for locally made trawler" on page A1 of the Sunday, June 4th, Seattle Times.

8. The new ship being built for Fisherman's Finest will stretch 264 feet long and 50 feet wide. While in the water its hull will reach 18 feet below the water line. The weight of a boat is directly related to the water it displaces, the volume of the ship beneath the water line. Each ton of sea water takes up 31.25 cubic feet. If the portion of the boat below water can be modeled as a triangular prism, then what will be the weight of the finished boat?

    A. 1800 tons

    B. 3800 tons

    C. 5400 tons

    D. 7600 tons

9. Based on a law from the 1920s called the Jones Act, for a boat to be used in the waters around the United States, it must have been manufactured and assembled almost entirely by US companies. Only 1.5% of its part by can have been worked on by foreigners. The boat being built for Fisherman's First had many of its steel plates worked on by a Dutch company, before they were shipped here to be further worked on and then assembled. Approximately how many tons of the steel used for the boat would have to be replaced so that the boat could comply with the Jones Act?

    A. 60 tons

    B. 160 tons

    C. 320 tons

    D. 380 tons

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