

Sum up the News – November, 7th, 2016

Vocabulary

1. A line with a slope of $-1/3$ is reflected across the line $y = 1$. If the line and its image intersect at $(5, 1)$, then what is the y-intercept of the image?

A. $(0, -16)$

B. $(0, -\frac{2}{3})$

C. $(0, \frac{8}{3})$

D. $(8, 0)$

2. A quadratic equation has two roots and its graph is symmetric across the y-axis. If one of the factors of the quadratic is $(2x + k)$, then what could be the other factor?

A. $(-1/2x + k)$

B. $(1/2x - k)$

C. $(x + 2k)$

D. $(-2x + k)$

3. Equilateral triangle FGH has a perimeter of 24 units. The dilation of FGH from point F produces triangle FJK. If $\overline{JK} = 2.5\overline{GH}$, then what is the length of \overline{GJ} ?

A. 8 units

B. 12 units

C. 15 units

D. 20 units

Based on the article “U.S. average fuel economy reaches high of 24.8 mpg” on page A13 of the November 3rd, Seattle Times.

4. The average fuel economy of cars 2015 was 24.8 miles per gallon, a 0.5 miles per gallon improvement over the year before. If the average us car travels 1,130 miles per month, then how many fewer gallons will the average car use?

- A. 0.9 fewer gallons per year
- B. 11.2 fewer gallons per year
- C. 72.8 fewer gallons per year
- D. 547 fewer gallons per year

5. Part of why average mileage is increasing is that vehicles weigh less on average than they used to. New materials and designs have led to a decrease of 25 pounds in average vehicle weight from 2014 to 2015. Another decrease of 50 pounds is expected once numbers for 2016 come in. If a vehicle's weight is inversely related to its fuel mileage, then what would the new mileage be after the average vehicle weight dropped again?

- A. 25.7 miles per gallon
- B. 25.8 miles per gallon
- C. 25.9 miles per gallon
- D. 26.0 miles per gallon

6. Government standards call for automakers to have their cars average 54.5 miles per gallon by 2025. They expect all automakers to be able to increase their mileage over the next couple years because of the reduced weight and through introducing direct injection engines, which will further raise fuel economy by 3%. Even if automakers apply both of those improvements by 2017, by what average annual percentage would they need their vehicles average fuel economy in the years following 2017 to meet the government standards?

- A. 8.3%
- B. 9.3%
- C. 11.2%
- D. 13%

Based on the article “The scramble to solve GE jet-engine explosion” on page D1 of the Sunday, November 6th, Seattle Times.

7. An American Airlines flight from Chicago to Miami was about to take off when one of its engines broke apart. The plane was traveling down the runway at 154 miles per hour but then applied its brakes and came to a stop 25 seconds later, 900 yards down the runway. What was the average rate of deceleration of the plane while it was braking?

- A. -5.4 feet / sec²
- B. -6.2 feet / sec²
- C. -7.3 feet / sec²
- D. -9.0 feet / sec²

8. The cylindrical turbine disc that broke apart is 2.2 feet in diameter and weighs 100 pounds. It's made of a heavy alloy to resist being warped by the high temperatures in the engine. If the alloy has a density of about 0.095 pounds per cubic inch, what was the average width of the disc in inches?

- A. $\frac{1}{2}$ inch
- B. $1\frac{1}{4}$ inches
- C. $1\frac{3}{4}$ inches
- D. $2\frac{1}{4}$ inches

9. The latest models of the CF6 engine has been used for 3 decades and have flown for 220 million hours. The 4,000 airplanes currently using them represent about 60% of all the airplanes to have used them. If the turbine discs are replaced every 15,000 flights and a disc on a typical plane is halfway through its replacement cycle, then how many hours on average are the flights that the CF6 engines are used on?

- A. 2.2 hours
- B. 4.4 hours
- C. 5.6 hours
- D. 7.3 hours

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