

Sum up the News – April 17th, 2017

Vocabulary

1. If the graph of the function $f(x)$ passes through the origin of the coordinate plane, then $f(x)$ cannot be which of the following types of functions?

- A. linear function
- B. rational function
- C. exponential function
- D. power function

2. Points S and T lie on circle M and intersect at point R, outside the circle. If \overline{RS} is a tangent line and \overline{RT} is a secant line. If $\overline{RT} > \overline{RS}$ then which of the following is true?

- A. angle RSM < angle RTM
- B. angle RSM > angle RTM
- C. angle RSM = angle RTM
- D. angle RSM = 90°

3. Triangle FGH is acute. If the sine of an angle in a triangle is proportional to the side of the opposite it, and \overline{GH} is the longest side, then which of the following must be true?

- A. $\sin F < \sin G + \sin H$
- B. $\sin F < \cos G + \cos H$
- C. $\tan F < \sin G + \sin H$
- D. $\sin G > \sin F + \sin H$

Based on the article “Share \$600M GET surplus? There’s a plan — and a catch” on page A1 of the Friday, April 14th, Seattle Times.

4. A proposal is being floated in the state legislature that would allow families with Guaranteed Education Credits (GET) to convert them into money in a 529 account, which are tax free if they are used for education. The value of the 529 accounts would then rise and fall in value with the stock market. One hundred of the GET units will always pay for a year of tuition and fees at Washington’s most expensive public school. For those who would choose to convert their units, the state would put \$140 per unit into a 529 savings account. The units currently cost \$117 to purchase, but a year of tuition and fees currently costs \$10,573. If a family with multiple students had GET units that would cost \$16,000 to purchase now, how much more valuable would their GET units be converted when into a 529 account than if they were used for tuition at the UW next year?

- A. \$2,300 more
- B. \$4,700 more
- C. \$8,800 more
- D. \$19,100 more

5. While tuition is set to remain stable through 2018, after that it will likely begin to increase again, as it did from 2000 through 2013. The nation’s stock market is overdue for a large drop as it has gone more 7 years since it has experienced a 20% decline. On average since 1900 the stock market has gone through decline that big every 5 years. If a family has a student planning on starting college in 2019 and the market declines by 20% before then, while tuition increases after 2018, how much would tuition have increase by to make keeping the GET credits make sense?

- A. 3%
- B. 4%
- C. 6%
- D. 8%

6. The state tried to open a 529 savings plan last year, but the state's requirement that fees be no more than $\frac{1}{2}$ of one percent led to financial services firms declining to bid on managing the fund. The GET fund has a current value of \$2.2 billion but that includes \$600 million in surplus funds, money above and beyond what will be needed to pay for tuition for its account holders. If $\frac{1}{4}$ of all the GET units were converted into 529 accounts, and the financial services firm managing the plan was charging the maximum fees allowable by the state, then what is the minimum amount that the firm could earn managing the 529 savings plan?

- A. \$1 million in fees
- B. \$2 million in fees
- C. \$4 million in fees
- D. \$8 million in fees

7. From 2005 through 2012, annual tuition and fees at the University of Washington increased exponentially from \$5,610 to \$12,383. If tuition begins to increase at that average annual rate again starting after 2018, how much would tuition be in 2022?

- A. \$14,800
- B. \$15,600
- C. \$16,600
- D. \$17,500

Based on the article "Bertha's done, but work on tunnel isn't" on page B1 of the Sunday, April 16th, Seattle Times.

8. The tunnel for highway 99 has been dug, but finishing the roadway remains and will take a couple more years of work. The 1.7-mile tunnel will likely have posted speed limits of 50 miles per hour, but in regular traffic actual speeds are expected to average just 20 miles per hour. How much longer would a trip through the tunnel at 20 miles per hour take than a trip at 50 miles per hour?

- A. 2 minutes longer
- B. 3 minutes longer
- C. 4 minutes longer
- D. 5 minutes longer

9. The tunnel will consist of two levels, one northbound, and one southbound, each with two lanes. Two lane highways have a maximum vehicle flow of 1400 cars per hour per lane. If a crash occurred while cars were moving 20 mph that blocked both northbound lanes a third of the way through the tunnel, how many cars already would be inside the tunnel and be stuck behind the crash?

- A. 40 cars
- B. 80 cars
- C. 120 cars
- D. 240 cars

10. Examine the graphic labeled “Inside the Highway 99 tunnel” on page B7. The interior of the tunnel has a diameter of 54 feet. If the southbound roadway lies on a diameter of the circle and its midpoint is at the center of the circular cross-section of the tunnel, then how tall is the western wall of the southbound lanes?

- A. 19 feet
- B. 22 feet
- C. 24 feet
- D. 32 feet

11. Examine the graphic labeled “Inside the Highway 99 tunnel” on page B7. The west wall of the southbound lanes is being constructed in two phases and each phase will use the same amount of concrete. On average the wall is 2 feet thick. If the density of concrete being used is roughly 150 pounds per cubic feet, then how many more tons of concrete are needed just to finish the westbound wall of the southbound lanes?

- A. 28,000 tons
- B. 30,800 tons
- C. 48,800 tons
- D. 54,600 tons

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