

Sum up the News – March 20th, 2017

Vocabulary

1. Three irrational numbers are multiplied together and their product is rational. The first two numbers are $\sqrt[4]{5}$ and $\sqrt[3]{5^2}$ and the third is 5^k . Which of the following expressions could be the value of the third number?

A. $5^{\frac{1}{12}}$

B. $5^{\frac{1}{6}}$

C. $5^{\frac{5}{7}}$

D. $5^{\frac{11}{12}}$

2. Some quadrilaterals have diagonals such that the area of the quadrilateral will be equal to one half of their product. Which of the following shapes do NOT have areas that can be found in this way?

A. kite

B. rectangle

C. rhombus

D. square

3. Lines \overleftrightarrow{FK} and \overleftrightarrow{GK} are both tangent to circle M and both F and G lie on the circle. If the measure of angle FKG is $^\circ$, what is the measure of minor arc \widehat{FG} ?

A. 20°

B. 80°

C. 110°

D. 200°

Based on the article “March Madness bracket racket puts billions at stake — all for fun, wink wink” on page A1 of the Tuesday, March 14th, Seattle Times.

4. Americans fill out 70 million brackets in pools, often run through their offices, and pay a collected \$2 billion in entry fees. While typical fees average under \$20, for a small percentage of pools the fees are much higher. If the average entry fee for the cheapest 90% of pools is \$15, what is the average entry for the other pools?

- A. \$100 / entry
- B. \$150 / entry
- C. \$200 / entry
- D. \$250 / entry

5. Player filling out brackets pick winners in each of the games in the tournament. The tournament starts with 64 teams and in each round half of the remaining teams are eliminated. Picking the winners of each the games correctly is incredibly unlikely. If each team had a 50% chance of winning each game, then after two rounds of games, how likely would a player have a perfect bracket?

- A. $2.9 * 10^{-39}$
- B. $3.6 * 10^{-15}$
- C. $2.3 * 10^{-10}$
- D. $1.1 * 10^{-7}$

6. In the early rounds of the tournaments, with the highest and lowest seeded teams of the tournament facing each other, the probability of correctly picking winners is higher than 50%. After two rounds, of the 18 million entries in ESPN’s brackets, 9 of the entries were still perfect. How likely was a person to correctly guess the outcome of any one of the games in the first two rounds?

- A. 68%
- B. 74%
- C. 77%
- D. 81%

Based on the article “‘Pluto-huggers’ push to restore planetary status” on page A5 of the Saturday, March 18th, Seattle Times.

7. Whether classified as a planet or dwarf planet, Pluto is significantly smaller than the eight planets in the solar system Pluto’s diameter is just 738 miles, about the distance across North America, whereas the Earth’s diameter is 3,959 miles. Jupiter’s volume is 200,000 times that of Pluto. If volume is directly related to the cube of volume, then how many times larger than Earth’s volumes Jupiter’s volume?

- A. 150 times larger
- B. 1,300 times larger
- C. 7,000 times larger
- D. 37,000 times larger

8. The main argument used to disqualify Pluto from planethood is that it has not “cleared its neighborhood,” which means that its orbit is still home to a significant number of asteroids and other debris orbiting the sun. Those lobbying for Pluto to regain its planethood note that the farther a planet is from the sun, the smaller its ability to debris out of its area, because both the planet and any debris would be travelling more slowly and because they have been through many fewer orbits. Pluto’s average orbital radius is 40 times that of Earth’s and it takes 248 years for it to complete one orbit. Roughly how many times faster is the Earth traveling around the sun than Pluto? (Assume circular orbits for both planets.)

- A. 1.16 times faster
- B. 1.5 times faster
- C. 6.2 times faster
- D. 7.3 times faster

Based on the article “Budget proposes added raises for over 18,000 state workers” on page B1 of the Sunday, March 19th, Seattle Times.

9. Examine the graph titled “State employee vacancy rates and proposed raises” on page B2. By what percentage will the total salaries for Washington State Patrol troopers increase under the proposed raises if the higher salaries result in the Patrol fully staffing the position?

- A. 19% increase
- B. 36% increase
- C. 40% increase
- D. 71% increase

10. Examine the graph titled “State worker pay” on page B2. The recession in 2008 and its aftermath decreased the rate of salary increases that state workers received. How much more was the average annual salary increase from 2006 to 2010 than from 2011 to 2016?

- A. \$500 more per year
- B. \$800 more per year
- C. \$1000 more per year
- D. \$1600 more per year

11. The state GOP hopes to offer an alternate plan where each worker instead receives a flat \$2000 raise. Even workers who might have a higher salary under this plan are worried about establishing a new precedent that would hurt them over time. If the workers would have the same salary after three budget cycles under the state GOP plan, either receiving \$2000 more each time or a 6% raise each time, then how much would they be making now?

- A. \$31,410
- B. \$33,333
- C. \$34,520
- D. \$36,000

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