Question 1. What is the following when expressed in simplified form with no negative exponents?

$$\frac{\sqrt[5]{96x^{27}y^{-33}z^{41}k^{39}}}{\sqrt[5]{3x^{-13}y^{-18}z^{26}k^{-11}}}$$

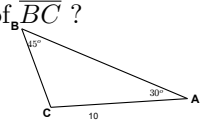
Answer: $\dfrac{2x^8z^3k^{10}}{y^3}$

Question 2. What is the following expressed in $a+bi$ form?

$$\frac{7+i}{3-i}+(2-i)^4+i^{253}$$

Answer: $-5-22i$

Question 3. In the given triangle ABC, angle A has degree measure 30, angle B has degree measure 45, and $\overline{AC}$ has length 10. What is the length of $\overline{BC}$?

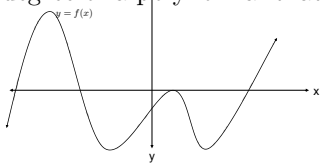


Answer: $5\sqrt{2}$

Question 4. How many minutes are there in the year 2010 ?

Answer: 525,600

Question 5. What is the least possible degree of a polynomial that has the following graph?



Answer: 5

Question 6. Evaluate

$$\sum_{k=1}^{2010}(-1)^k(2k)$$

Answer : 2010

Question 7. What value of $\theta, 0^o \leq \theta \leq 180^o$ satisfies the equation

$$\sin(30^o+\theta)+\sin(30^o-\theta)=\frac{1}{2}$$

Answer: 60^o

Question 8. What is the smallest value of a positive integer N that leaves a remainder of 1 when divided by 2, 3, 4, 5, 6, and 7?

Answer: 421

Question 9. How many integral solutions satisfy the following conditions?

$$\left|\frac{x-3}{2}\right| < 5 \text{ and } \left|\frac{x+1}{3}\right| \geq 1$$

Answer: 14

Question 10. What is the vertex of the following conic whose x-coordinate is the larger?

$$\frac{(x-1)^2}{4} + (y+1)^2 = 1$$

Answer: (3,-1)

Question 11. What is the smallest prime number that is larger than 200?

Answer: 211

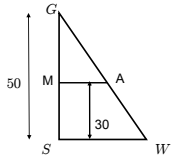
Question 12. What is the largest area possible when a rectangle is formed from a 360-inch length of non-stretchable cord?

Answer: 8100 Square inches

Question 13. In a ten-team baseball region, if every team plays every other team 4 times during the season, how many games must be scheduled?

Answer: 180

Question 14. In the given right triangle GSW, the height is 50 cm, the line MA is parallel to the base and is 30 cm above the base, and the area of the trapezoid $MAWS$ is 210 square cm. What is the length of the base SW?



Answer: 10

Question 15. Find the real numbers A and B in the following identity

$$\sin(4\theta) = 2A\sin\theta\cos^3\theta + 2B\sin^3\theta\cos\theta$$

Answer: $A = 2$ and $B = -2$

Question 16. Which is the largest number from this list: $\log_2 32$, $\log_e e^2$, $\log_{(10)} 1000$, $4\log_{(10)} 10$, or $5\log_5 125$?

Answer: $5\log_5 125$ or 15