

SASMO Grade 9 (Secondary 3) Sample Questions

1. Arrange 2^{18} , 3^{12} and 4^6 in ascending order (i.e. from smallest to biggest).

2. The Fibonacci numbers are 1, 1, 2, 3, 5, 8, 13, ..., where each term after the second term is obtained by adding the previous two terms. How many of the first 2014 Fibonacci numbers are odd?

3. Solve $\sqrt{x + \sqrt{x + \sqrt{x + \dots}}} = 4$.

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4. Find the smallest whole number that leaves a remainder of 1 when divided by 3, a remainder of 2 when divided by 5, and a remainder of 3 when divided by 7.

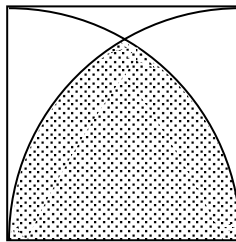
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5. Evaluate $20142015 \times 20152014 - 20142014 \times 20152015$.

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6. If $1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \frac{1}{5^2} + \dots = x$, express $1 + \frac{1}{2^2} + \frac{1}{4^2} + \frac{1}{6^2} + \frac{1}{8^2} + \dots$ in terms of x .

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7. Find the exact value of $\frac{1}{1+\frac{1}{1+\dots}}$.

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8. The diagram shows a square of length 6 cm and two quarter-circular arcs of radius 6 cm. Find the area of the shaded region, leaving your answer in terms of π and surds.



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9. Given that $n! = n \times (n-1) \times (n-2) \times \dots \times 3 \times 2 \times 1$, find the last digit of
- $$1! + 2! + 3! + \dots + 2014!$$

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10. Let x be a number such that $x + \frac{1}{x} = 5$. Find the value of $x^4 + \frac{1}{x^4}$.

End of paper

| <u>Solutions</u> | |
|-------------------------|---|
| 1. | $4^6, 2^{18}$ and 3^{12} |
| 2. | 1343 |
| 3. | 12 |
| 4. | 52 |
| 5. | 10 000 |
| 6. | $1 + \frac{1}{4}x$ or $\frac{x + 1}{4}$ |
| 7. | $\frac{\sqrt{5} - 1}{2}$ |
| 8. | $12\pi - 9\sqrt{3}$ |
| 9. | 3 |
| 10. | 527 |