CLASS 1 FOR SMART KIDS

Answer Key to Class 1

1. B) $(1 + 2) \times (2007 \times 2008)$.
   Compare the following: $(1+2) > (1 \bullet 2)$; $(2007 \bullet 2008) > (2007 + 2008)$; and $(1+2) \bullet (2007 \bullet 2008) > (1+2) + (2007 \bullet 2008)$.

2. C) 2. Notice there is 22 students altogether. Half has a cold = 11, so take $11 - 9 = 2$.

3. B) $^1/_3$. Substitute 2 in the second expression to obtain $\frac{1}{1+2} = \frac{1}{3}$

4. C) 5. Since it takes 50 seconds to complete one full circle, divide 50 by 10 to get 5.

5. E) 1. The first sum is $2+0+0+8 = 10$, then $1+0 = 1$.

6. B) 24. Since the two perimeters are equal to 16, we know that the two sides of the triangle are equal to 12. Then adding $12 + 4 + 4 + 4 = 24$.

7. B) Find the highest common divisor of 24, 42, $36 = 6$.

8. A) 52°. First find the two angles on the bottom. $180 - 124 = 56$; $180 - 108 = 72$. Adding 72 and 56 we have 128. Then subtract $180 - 128 = 52$.

9. C) 2. The two pairs of numbers are (2 and 6) and (5 and 3).

10. A) 1806. The answer has to be between 40 and 50 to fit in the answers provided. By trial and error we can try $x = 43$. Squaring 43 we get 1849. Subtract his age $1849 - 43 = 1806$.

11. A) 5^0. Let x = angle PBC. Then angle PCB = 50 + x. The sum of the angles in a triangle is 180. Solving the equation $x + 50 + x + 120 = 180$, gives $x = 5^0$.

12. C) 60 cm. Let the sides of the rectangles be a and b. The equation for the perimeter of the first two rectangles is $b + 2a = 40$. Similarly, the perimeter for the second two rectangles is $a + 2b = 50$. Setting up a system of equations $b + 2a = 40$ and $a + 2b = 50$ we get $3a + 3b = 90$. Dividing by three we get $a + b = 30$. Thus the perimeter of the original rectangle is $2a + 2b = 60$.

13. A) 25. Start by drawing the segment BC = 11, then CD = 14, which gives CA = 2 and DA = 12. The distance between BD = 25.

14. D) 108 cm^2. The base of the triangle is 3 times the radius of the circle = 18. The height of the triangle is twice the radius = 12. Thus the area: $1/2(12)(18) = 108$.

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15. D) 61. There are 125 unit cubes that make up the bigger cube. Each side is made up of 25 unit cubes. Taking a picture we see 25 distinct unit cubes on the front wall, the right side we can see additional 20 (since we already counted five of them on the front), on the top we see 16 (we have already counted five from the front and four from the right side). Adding $25 + 20 + 16 = 61$.

16. C) 105. Follow the pattern: $6 * 5 = (6 + 5 + 4 + 3 + 2 + 1) \bullet 5 = 21 \bullet 5 = 105$.

17. C) 108°. Let angle BCD = x. Then angle DCA also equals x. Since triangle ABC is isosceles we know that angle CBD = 2x. Also, since triangle BCD is isosceles, angle BDC is equal 2x. Solving the equation $2x + 2x + x = 180$ we get that $x = 36$. Then angle BDC = 72. So $180 - 72 = 108$.

18. D) 864. For a maximum value of KAN, we want to try the maximum value of OO = 99. To obtain the greatest KAN we use 8 for K. Then in order to get 99 we use 7 for G. To get 99, A is 6 and R needs to be by one bigger then N. Thus R is 5 and N is 4. For KAN we obtain 864.

19. C) 5. Test each answer. A) $^{3}/_{7} = 43\%$; B) $^{4}/_{9} = 44\%$; C) $^{5}/_{11} = 45.5\%$; D) $^{6}/_{13} = 46\%$ and E) $^{7}/_{15} = 47\%$. Thus the smallest one between 45% and 50% is $^{5}/_{11}$.

20. Since the boy tells the truth on two consecutive days, Thursday and Friday, the two possibilities are either John or Bob. If we assume that Bob is the answer, counting the answers we get that he answered Bob on Tuesday, which is a lie. Therefore, the answer is John.