XV. GIMNAZIJA, ZAGREB

INTERNATIONAL BACCALAUREATE MIDDLE YEARS PROGRAM
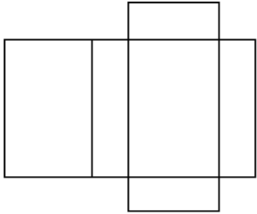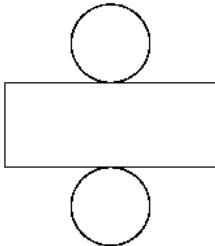
**ENTRANCE EXAM – MATHEMATICS, 17th June 2013.**

GRADE 9

Time: 60 min

NAME: _____

| 1.<br><br>1 pt | Calculate: $10.5 - 2 \cdot \left(2.5 - \dfrac{1}{2}\right)^2 - \sqrt{6.25}$<br><br><br><br><br><br><br>*Answer*: _____ |
|---|---|
| 2.<br><br>1 pt | In a right-angled triangle the longest side is 15 cm long. The shortest side is 9 cm long. How long is the third side?<br><br><br><br><br>*Answer*: _____ |
| 3.<br><br>1pt | To make enough juice for 4 people, 300 ml of concentrate needs to be mixed with water. How much concentrate is needed to make enough juice for 9 people?<br><br><br><br><br>*Answer*: _____ |

| | |
|---|---|
| 4.<br><br>1pt | After three weeks of football training, Rick's weight decreased by 5%. If h<br>kg before training, what did he weigh after three weeks of training?<br><br><br><br><br><br><br><br>*Answer*: _____ |
| 5.<br><br>2pts | The nets of two solids are given below. Name the solid form from each net.<br>a)                                                    b)<br><br><br><br><br><br><br><br><br><br>*Answer*: a) _____<br><br><br>b) _____ |
| 6.<br><br>2pts | For the following problem form an equation and solve it.<br>If 5 is added to a certain number and the result is multiplied by 4 the answer is 56. Find the number.<br><br><br><br><br><br><br><br><br><br><br>*Answer*: _____ |

**7.**

**1pt**

a) Given that $S = u \cdot t + \dfrac{1}{2} a \cdot t^2$, evaluate $S$ for $u = 7$, $t = 3$, $a = 10$.

*Answer*: $S =$ _____

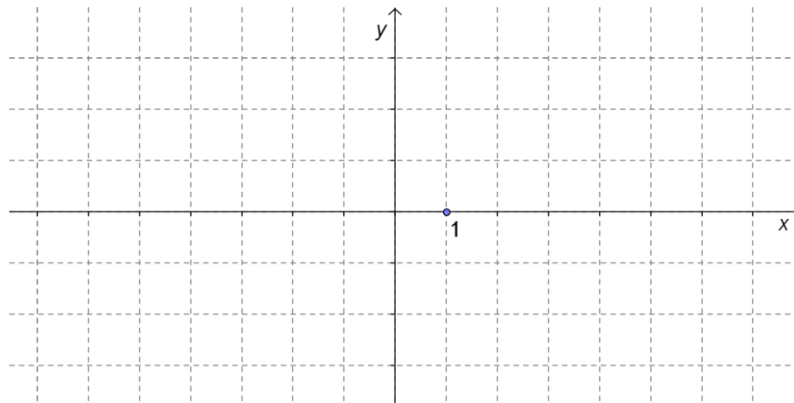b) Given that $F = 32 + \dfrac{9C}{5}$, evaluate $C$ for $F = 100$.

**1pt**

*Answer*: $C =$ _____

**8.**

a) Graph the linear function $f(x) = \dfrac{2}{3} x - 2$.

**1pts**



b) Does the point $A$ (315, 212) belong to the graph? Explain!

**1pts**

*Answer*:_____

_____

| | |
|---|---|
| 9.<br><br>2pts | If a circular running track has diameter of 140 m, find how many complete laps must be run to cover at least 10 000 m.<br><br><br><br><br><br><br><br>*Answer*: _____ |
| 10.<br><br>2pts | Solve the system: $\begin{cases} x + \dfrac{3}{2}y = 1 \\ \dfrac{3}{2}x - y = -5 \end{cases}$<br><br><br><br><br><br><br><br><br><br><br>*Answer*: $x =$ _____ , $y =$ _____ |
| 11.<br><br>3pts | Find the volume and the surface area of a square prism whose perimeter of the base is 20 *cm* and the height is 8 *cm*.<br><br><br><br><br><br><br><br><br>*Answer*: Volume is _____<br><br>Surface area is _____ |

4

| 12. | (a) Look at the rectangles below, all with 5 cells: |

| 1 | 2 | 3 | 5 | 8 |    | 10 | 4 | 14 | 18 | 32 |    | -3 | 4 | 1 | 5 | 6 |

**1pt**

If you were given the first two numbers in each rectangle, could you work out the others? Describe the rule you see.

*Answer:*_____

_____

(b) Look at the rectangles below. Use the rule you have found to fill in the cells.

**2 pts**

| 12 | 7 |   |   |   |    | 8 |   | 12 |   |   |