Name:
Group 2
Result:

1.   [3]

Place the following numbers in appropriate regions of the diagram below:

$$\frac{30}{6} \qquad \sqrt[3]{8} \qquad (-2)^{25} \qquad \frac{66666666666666669}{3} \qquad 3^{-2}$$

2.   [2]

Calculate:

$$\gcd(1620, 378) = \qquad\qquad\qquad \operatorname{lcm}(90, 72) =$$

3. Expand (if possible) and simplify: [3]

(a) $3\sqrt{72} - 4\sqrt{50} + 2\sqrt{32}$

(b) $(2 - \sqrt{2})^2 - 3(\sqrt{2} + 1)^2 - (\sqrt{2} + 5)(\sqrt{2} - 5) =$

4. Rationalize the denominators in the following expressions: [3]

(a) $\dfrac{6}{\sqrt{5}} =$

(b) $\dfrac{6 - \sqrt{2}}{6 + \sqrt{2}} =$

5. Solve the following equations: [4]

(a) $\dfrac{x-5}{4} - \dfrac{2x+1}{3} = \dfrac{3-x}{2}$

(b) $(2x-3)^2 - (3x+1)^2 = 5(3-x)(3+x)$

6. Write without the absolute value and simplify: [1]

$$|4 - \sqrt{7}| + |\sqrt{7} - 5| - |2\sqrt{7} - 3| =$$

7. Solve the following equation: [4]

(a) $3|2x + 5| + 13 = 9$

(b) $\dfrac{|x - 2| + 3}{2} - \dfrac{|2 - x| - 2}{3} = 4$

8. Write the following expressions as a single power of 2 (part (a)) or 5 (part (b)):   [4]

(a) $\dfrac{\left(\frac{1}{8}\right)^{-2} \cdot 4^4 \cdot \frac{1}{32}}{(\sqrt{2})^{12} \cdot (0.25)^{-2}}$

(b) $\dfrac{(0.2)^{-2} \cdot 25^{-3} \cdot \frac{1}{125}}{(0.04)^2 \cdot (\sqrt[3]{25})^9}$

9.   [2]
The price of an item has been increased by 16% and then decreased by 8%. Find the initial price, if after the two changes the final price is 1280.64 PLN.

10. [2]

An item cost 1100. After the price was increased by $p\%$ **twice**, the price changed to 1454.75. Calculate p.

11. [2]

An item cost 1800. The price was increased by $p\%$ and then decreased by $p\%$. As a result of these two changes the price is now 1759.5. Calculate p.

12. [2]

Calculate

$$\frac{(1.43 \cdot 10^9) \cdot (3.21 \cdot 10^{-3})}{(8.53 \cdot 10^{15}) \cdot (9.21 \cdot 10^{11})} =$$

Write your answer in standard form and rounded to 3 significant figures.

13. [3]

Round the following numbers as required:

	2 decimal places	2 significant figures	nearest integer
639.673			
0.050051			
235202.5632			

14. [2]

A rectangular field is 287 metres long and 31 metres wide. Round these measurements to 1 significant figure to approximate the area of the field and calculate the percentage error of your approximation.

15.   [3]

The distance from Warsaw to Radom is 100 km rounded to 2 s.f. If a car is travelling at an average velocity of 80 km per hour (rounded to 1 s. f.), estimate the time of the journey and calculate the maximum percentage error of your estimate.