Name:

Group 1

Result:

1. (1 point) Which of the following numbers is equal to $\sqrt{5}$? Choose all that apply:

   A. $\left(\dfrac{1}{5}\right)^{-\frac{1}{2}}$ B. $\sqrt{2} + \sqrt{3}$ C. $125^{\frac{1}{6}}$ D. $\sqrt{45} - \sqrt{20}$

2. (1 point) The sides of a rectangle has been measured to be $80dm$ and $20dm$ correct to the nearest $10dm$. The lower bound for the area of the rectangle is (select all that apply):

   A. $11250\ cm^2$ B. $112.5\ m^2$ C. $1.125\ m^2$ D. none of the A,B,C

3. (1 point) Which of the following pairs of numbers are co-prime. Select all that apply:

   A. 3213 and 15   B. 40 and 27   C. 32 and 45   D. 2^{100} and 3^{100}

4. (1 point) $\dfrac{3}{2-\sqrt{3}} - \dfrac{2}{\sqrt{3}-\sqrt{2}} =$ (select all that apply)

   A. $6 + \sqrt{3} + \sqrt{8}$ B. $6 + \sqrt{3} - \sqrt{8}$ C. $6 + \sqrt{3} + 2\sqrt{2}$ D. $6 + \sqrt{3} - 2\sqrt{2}$

5. (1 point) Which of the following numbers are divisible by 9? Select all that apply.

   A. $\underbrace{111...1}_{30\ digits}$ B. $\underbrace{333...3}_{30\ digits}$ C. $\underbrace{555...5}_{30\ digits}$ D. $\underbrace{666...6}_{30\ digits}$

6. (2 points) A price of a certain item increased by $p\%$ and then decreased by $p\%$. If the final price is 9% smaller than the original price, find the value of p.

7. (2 points) List all positive divisors of 56. State which of these divisors are prime numbers.

8. (2 points) Show that a square of an odd number gives a remainder of 1 when divided by 4.

9. (2 points) Simplify the following, leave your answer in the form a^k, where $a \in \mathbb{N}$ and $k \in \mathbb{Q}$:

$$\frac{2^5 \times \sqrt[4]{8} \times 16^{-1/2}}{\left(\frac{1}{4}\right)^{-2} \times 8^{-1} \times \sqrt{2}}$$

10. (2 points) Simplify the following, leave your answer in the form $x^m y^n$, where $m, n \in \mathbb{Q}$:

$$\frac{\sqrt[3]{x^2 y^5} \times x^{-1} \times (x^2 y)^3}{(x\sqrt{y})^3}$$

11. (5 points) A shipping container is a cuboid with dimensions 19m, 1.75m and 2.25m.

    (a) Calculate the exact volume of the container in dm^3.

    (b) Express your answer to part (a) in the standard form.

    John estimates the volume of the container by first rounding the dimensions to 1 significant figure.

    (c) Calculate John's estimate of the volume, give your answer in dm^3.

    (d) Calculate percentage error in John's estimate, give your answer correct to 3 significant figures.

    A water is poured into the container at the rate of 5 litres per second.

    (e) Calculate how long it would take to completely fill the container. Give your answer in minutes, correct to the nearest minute.