Imię i nazwisko:

Klasa:

Grupa 1

Wynik:

Question 1 *(1 pt)*

After simplifying the expression $\dfrac{(4x^2 - 4x + 1)(x^3 - 8)}{(4x^2 - 1)(x - 2)}$ becomes:

A. $\dfrac{(x^2 - 4)^2}{2x + 1}$ B. $\dfrac{(2x - 1)(x^2 - 4)}{2x + 1}$ C. $\dfrac{(2x - 1)(x^2 + x + 1)}{2x + 1}$ D. $\dfrac{(2x - 1)(x + 1)^2}{2x + 1}$

Question 2 *(1 pt)*

Solve:
$$3 \times 2^{12}x = 2^{13}x + 2^{11}$$

A. $x = \frac{1}{2}$ B. $x = 2$ C. $x = 2^{11}$ D. $x = 2^{12}$

Question 3 *(1 pt)*

$$\left(\sqrt{\sqrt{5} - 1} + \sqrt{\sqrt{5} + 1}\right)^2 =$$

A. 6   B. $2\sqrt{5}$ C. $2\sqrt{5} + 2$ D. $2\sqrt{5} + 4$

Question 4 *(1 pt)*

$\sqrt{17 - 12\sqrt{2}} =$

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

Question 5 *(1 pt)*

The following expression
$$\frac{(16^{0.5} \div 2^{-3})^{0.2} \times (16^{0.75} \div (0.25)^{-2})^{-2}}{(32^{-1} \times (0.125)^{-4})^{0.5}}$$

is equal to:

A. $\dfrac{1}{2}$ B. $\dfrac{\sqrt{2}}{2}$ C. $\sqrt{2}$ D. 2

Question 6 *(2 pts)*

Solve:

$$\sqrt{x^2 - 6x + 9} = 5$$

Question 7 *(3 pts)*

Solve:

$$(2x - 1)^2 - (3x + 1)(x - 2) = (x + 4)^2$$

Question 8 *(3 pts)*

Prove that $7^{12} - 6^{12}$ is divisible by 13.

Question 9 *(3 pts)*

Calculate $(\sqrt{2} + \sqrt{3} + \sqrt{5})^2$. Hence find $\sqrt{10 + \sqrt{24} + \sqrt{40} + \sqrt{60}}$.

Question 10 *(4 pts)*
Solve the inequality

$$(x-2)^3 - (2x-1)^3 > (x^2-1)(2-7x) + (2x+1)^2$$

Write down a rational number that satisfies the inequality and an irrational number that does **not** satisfy the inequality.

Extra question
Calculate $\sqrt[3]{6\sqrt{3}+10} - \sqrt{3}$