2.1 A Useful "Flip"

Power Inversion Rule

$$\left(\frac{p}{q}\right)^{-m} = \left(\frac{q}{p}\right)^{m} \qquad p,\ q \neq 0$$

2.2 Examples

Simplify fully each of the following,

(i) $\left(\dfrac{3a^6}{5a^2\sqrt{b}}\right)^{-2}$ **(ii)** $\left(\dfrac{4x^2}{9\sqrt[3]{y}}\right)^{-\frac{3}{2}}$

[3, 3 marks]

2.3 Revision Exercise

Any solution based entirely on graphical
or numerical methods is not acceptable
Marks Available : 40

Question 1

Simplify fully each of the following

(i) $\left(\dfrac{36x^6}{25}\right)^{-\frac{1}{2}}$ **(ii)** $\left(\dfrac{4xy^2}{3x^2y^3}\right)^{-1}$

[3, 3 marks]

Question 2

Expand the brackets and simplify; $(x + 3)(x - 3)(x + 4)$

[3 marks]

Question 3

Factorise completely, $4x^2 - x^4$

[3 marks]

Question 4

Showing your method, rationalise the denominator of, $\frac{8}{3 - \sqrt{5}}$

[3 marks]

Question 5

(i) Simplify $\sqrt{75} + \sqrt{12}$, giving your answer in the form $a\sqrt{3}$, where a is an integer to be found.

[2 marks]

(ii) Simplify $\dfrac{\sqrt{75} + \sqrt{12}}{2 - \sqrt{3}}$ giving your answer in the form $b + c\sqrt{3}$ where b and c are integers to be found.

[4 marks]

Question 6

Here is a FALSE PROOF that, $\dfrac{a+b}{a-\sqrt{b}} = \dfrac{a+\sqrt{b}}{a-b}$ where $a \neq b$, $a \neq \sqrt{b}$

$$\text{LHS} = \frac{a+b}{a-\sqrt{b}}$$

$$= \frac{a+b}{a-\sqrt{b}} \times \frac{a+\sqrt{b}}{a+\sqrt{b}}$$

$$= \frac{(a+b)(a+\sqrt{b})}{a^2-b^2}$$

$$= \frac{(a+b)(a+\sqrt{b})}{(a+b)(a-b)} \quad \text{(Difference of two squares)}$$

$$= \frac{a+\sqrt{b}}{a-b}$$

$$= \text{RHS} \qquad \square$$

Where is the error ?

[3 marks]

Question 7

A-Level Examination Question from November 2021, Paper 1, Q1 (Edexcel)

Using algebra, solve the inequality

$$x^2 - x > 20$$

writing your answer in set notation.

[3 marks]

Question 8

Given that $y = 3^x$

(i) Express 9^x in terms of y

[1 mark]

(ii) Hence, or otherwise, solve $9\left(9^x\right) - 10\left(3^x\right) + 1 = 0$

[6 marks]

Question 9

AS-Level Examination Question from October 2020, Paper 1, Q3 (Edexcel)

(i) Solve the equation,

$$x\sqrt{2} - \sqrt{18} = x$$

writing the answer as a surd in simplest form.

[3 marks]

(ii) Solve the equation,

$$4^{3x-2} = \frac{1}{2\sqrt{2}}$$

[3 marks]