

Quiz 10

Question 1. (3 marks) Rationalize the denominator:

$$\frac{\sqrt{12}}{\sqrt{3}+1} = \frac{\sqrt{12}}{\sqrt{3}+1} \cdot \frac{\sqrt{3}-1}{\sqrt{3}-1} = \frac{\sqrt{36} - \sqrt{12}}{3 - \sqrt{3} + \sqrt{3} - 1} = \frac{6 - \sqrt{4}\sqrt{3}}{2}$$

$$= \frac{6 - 2\sqrt{3}}{2} = \frac{2(3 - \sqrt{3})}{2} = 3 - \sqrt{3}$$

Question 2. (3 marks) simplify (without using decimals, show your work):

$$\frac{6^{\frac{1}{5}} \cdot 6^{\frac{3}{5}}}{6^{-\frac{1}{5}}} = \frac{6^{\frac{1}{5} + \frac{3}{5}}}{6^{-\frac{1}{5}}} = \frac{6^{\frac{4}{5}}}{6^{-\frac{1}{5}}} = 6^{\frac{4}{5} - (-\frac{1}{5})}$$

$$= 6^{\frac{5}{5}} = 6$$

Question 3. (4 marks) Solve for x:

$$3\sqrt{x-2} = x-2$$

$$(3\sqrt{x-2})^2 = (x-2)^2$$

$$9(x-2) = (x-2)(x-2)$$

$$9x - 18 = x^2 - 4x + 4$$

$$0 = x^2 - 13x + 22$$

$$0 = (x-11)(x-2)$$

$$\swarrow x-11=0$$

$$x=11$$

$$\searrow x-2=0$$

$$x=2$$

CHECK:

$$x=11$$

$$3\sqrt{11-2} = 11-2 ?$$

$$3\sqrt{9} = 9 ?$$

$$9 = 9 \text{ TRUE}$$

$$x=2$$

$$3\sqrt{2-2} = 2-2 ?$$

$$0 = 0 \text{ TRUE}$$

$$\therefore \boxed{x=2, 11}$$