

Quiz: Practice Regents problems #1

1. Algebraically solve for  $x$ :  $5 = \sqrt{2x+3}$

$$25 = 2x + 3$$

$$2x = 22$$

$$x = 11$$

$$\begin{aligned} &\text{check} \\ 5 &= \sqrt{2(11)+3} \\ 5 &= \sqrt{25} \quad \checkmark \end{aligned}$$

$$x = 11$$

2. Solve the equation  $x = 5 + \sqrt{3x-11}$  algebraically.

$$x - 5 = \sqrt{3x - 11}$$

$$(x - 5)^2 = 3x - 11$$

$$x^2 - 10x + 25 = 3x - 11$$

$$x^2 - 13x + 36 = 0$$

$$(x - 4)(x - 9) = 0$$

$$(4) = 5 + \sqrt{3(4) - 11} \quad ?$$

$$4 \neq 5 + \sqrt{1}$$

Reject 4

$$9 = 5 + \sqrt{3(9) - 11} \quad ?$$

$$9 = 5 + \sqrt{16} \quad \checkmark \quad x = 9$$

3. Given  $x > 0$ , simplify the expression  $3x^{\frac{1}{2}}x^{\frac{3}{2}}$ .

$$3x^2$$

4. Given  $a > 0$ , solve the equation  $2a^{2x} = \sqrt[3]{8a}$  for  $x$ .

$$2a^{2x} = 2a^{\frac{1}{3}}$$

$$2x = \frac{1}{3}$$

$$x = \frac{1}{6}$$

5. A sequence is defined recursively by  $a_1 = 3$  and  $a_{n+1} = 2a_n - 1$  for  $n \geq 1$ . Find the first four terms of the sequence.

~~4, 5, 9, 17~~

3, 5, 9, 17

6. A geometric sequence has a first term of  $a_1 = 8$  and a common ratio of  $r = \frac{1}{2}$ . Write the recursive formula for the sequence.

$$a_1 = 8$$

$$a_{n+1} = \frac{1}{2} a_n$$

7. Write the expression  $s - t$  in the form  $a + bi$  with  $a, b$  real numbers, given  $s = -7 - 4i$  and  $t = 2 - 3i$ .

$$\begin{aligned} s - t &= -7 - 4i - (2 - 3i) \\ &= -9 - i \end{aligned}$$

8. Given that  $x$  is real number, simplify the expression  $xi(3 + 2i)$  and write it in simplest  $a + bi$  form with  $a, b$  real numbers.

$$= 3xi + 2xi^2$$

$$= -2x + 3xi$$

$$i^2 = -1$$