

#### 4.9 Test: Cumulative year-to-date standards

##### A1-APR.1 Perform operations with polynomials

1. Find the difference  $f(x) - g(x)$  as a polynomial in standard form, given:

$$f(x) = x^4 - 3x^3 - 3x^2 - 2x + 5 \quad \text{and} \quad g(x) = 2x^4 - x^3 + 2x + 5.$$

2. Select each correct equation.

(a)  $x^2 + 14 = x^2 + 7^2$

(e)  $x^2 - 14x + 49 = (x + 7)^2$

(b)  $x^2 + 49 = (x - 7)(x + 7)$

(f)  $x^2 - 14x + 49 = (x - 7)^2$

(c)  $x^2 - 49 = (x - 7)(x + 7)$

(g)  $x^3 + y^3 = (x + y)(x^2 - xy + y^2)$

(d)  $x^2 + 14x + 49 = (x - 7)^2$

(h)  $x^3 + y^3 = (x - y)(x^2 - xy + y^2)$

##### A2-A.APR.3 Identify zeros of polynomials given suitable factorizations

3. Write down the solutions to the equation  $(x - 7)(4x + 3)(x - 2) = 0$ .

##### A2-A.REI.2 Solve rational and radical equations, identify extraneous solutions

4. Square both sides of the equation and solve for  $x$ .

(a)  $\sqrt{x + 9} = 4$

(b) Check your solution.

5. Solve for  $x$  and check.

(a)  $\sqrt{5x + 16} + 5 = 14$

(b) Check your solution.

6. Solve for  $x$ .  $\frac{8}{x+3} = \frac{x+1}{x}$

**A2-F.BF.2 Write arithmetic and geometric sequences with recursive formulas**

7. Write a recursive definition of the sequence  $a_1 = 0.25$ ,  $a_2 = 0.75$ ,  $a_3 = 1.25$ ,  $a_4 = 1.75, \dots$

8. Write a recursive definition of the geometric sequence  $b$ .

$n$	$b_n$
1	-1
2	5
3	-25

BECA / Huson / Precalculus: 3. Complex numbers    First and last name:  
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**A2.N.CN.2 Apply the properties of complex numbers**

9. Write each expression in the form  $a + bi$  with  $a, b$  real numbers.

Given  $s = 2 - 5i$  and  $t = 9 - 3i$ .

(a)  $s + t =$

(b)  $s - t =$

(c)  $st =$

10. Simplify each expression, using complex numbers as necessary.

(a)  $\sqrt{-49} =$

(b)  $\frac{1}{2}\sqrt{-12} =$

11. Does the equation  $x^2 + 3x + 7 = 0$  have imaginary solutions? Justify your answer.

**A2.HSN.RN.2 Expressions with radicals and rational exponents**

12. Simplify each radical expression, using complex numbers as necessary.

(a)  $\sqrt{64} =$

(c)  $\sqrt{-9} =$

(b)  $\sqrt{27} =$

(d)  $\frac{\sqrt{-50}}{\sqrt{2}} =$

13. Simplify each expression.

(a)  $125^{\frac{2}{3}} =$

(b)  $\left(\sqrt[3]{\frac{8}{27}}\right)^2 =$

14. Rewrite each expression as a fractional exponent in simplest terms.  $x > 0$

(a)  $\sqrt[3]{7} =$

(c)  $\sqrt[2]{x^4} =$

(b)  $\frac{1}{\sqrt[3]{5}} =$

(d)  $\frac{1}{(\sqrt[3]{x})^2} =$

15. Rewrite each expression with fractional exponent as a radical.

(a)  $5^{\frac{1}{4}} =$

(c)  $x^{\frac{2}{5}} =$

(b)  $5^{-\frac{1}{3}} =$

(d)  $x^{-\frac{1}{3}} =$