## **1.5A Polynomial Functions and Complex Zeros**

## AP Precalculus

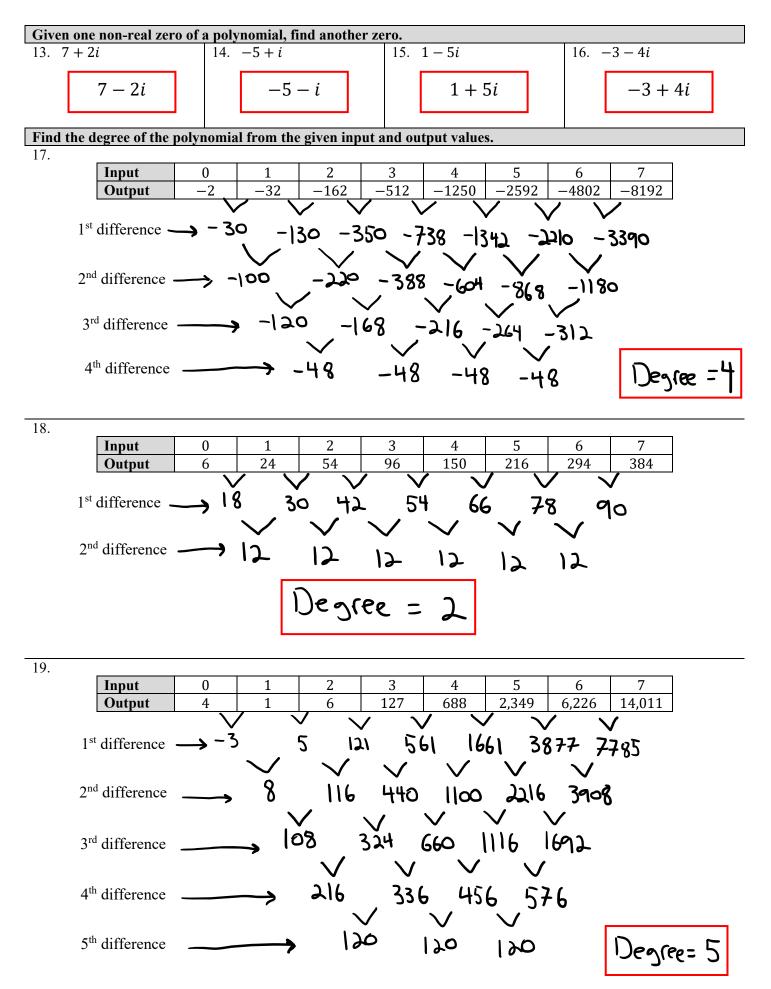
## 1.5A Practice

For each polynomial function, find the intervals for each condition.

1. 
$$f(x) = x^2 - 5x + 4$$
. When is  $f(x) \le 0$ ?  
 $0 = (x - 4)(x - 1)$   
 $x - 4 = 0$   $x - 1 = 0$   
 $x = 4$   $x = 1$   
 $x - 4 = 0$   $x - 1 = 0$   
 $x = 4$   $x = 1$   
 $x - 4 = 0$   $x - 1 = 0$   
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 $x = 4$   $x = 1$   
 $y - 4 = 0$   $x - 1 = 0$   
 $x = 4$   $x = 1$   
 $y - 4 = 0$   $x - 1 = 0$   
 $x = 4$   $x = 1$   
 $y - 4 = 0$   $x - 1 = 0$   
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 $x = 4$   $x = 1$   
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 $x = 4$   $x = 1$   
 $y - 4 = 0$   
 $x = 1$   
 $x$ 

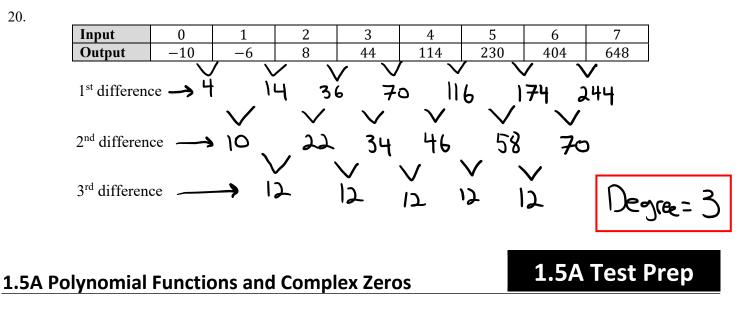
2. 
$$g(x) = x^2 + 17x + 70$$
. When is  $g(x) \ge 0$ ?  
 $\bigcirc = (x + 7)(x + 10)$   
 $X = -7$   $X = -10$   
 $\xrightarrow{X}(-\infty, -10) - 10(-10, -7) - 7(-7, \infty)$   
 $f(x)$  pos.  $\bigcirc \square \square \square \bigcirc \square \square \bigcirc \square$   
 $g(x) \ge 0$  on the interval  $(-\infty, -10] \cup [-7, \infty)$ .

3. $p(x) = (x - 7)(x - 1)^2$ . When is $\begin{array}{c} X = 7  X = \\ \begin{array}{c}                                     $	<u>(7,∞)</u> Pos	$o = x(x^{2})$ $o = x(x + x^{2})$ $x = o = x(x + x^{2})$ $x = x(x$	
5. $a(x) = x(x-8)^3(x+3)^4$ . When x = 0, x = 8, x = -3 even mult. $x   (-\infty, -3)   -3   (-3, 0)   0   (0, 8)   0$ f(x)   cos   0   cos   0   cos   0   cos   0		$f(x) \le 0?$	$(x + 4)^{2}(x + 1)(x - 6)^{6}$ . When is (x = 0  x = -4  x = -1  x = 6 It ever mult. (x + 3 - 1) - 1(-1, 0) = (0, 6) = 6 - (6, 00) (x + 3 - 1) - 1(-1, 0) = 0 = (0, 6) = 6 - (6, 00) (x + 3 - 1) - 1(-1, 0) = 0 = (0, 6) = 6 - (6, 00) (x + 3 - 1) - 1(-1, 0) = 0 = (0, 6) = 0 = 0
$a(x) \ge 0$ on the interval $(-\infty, 0] \cup [8, \infty)$ . $f(x) \le 0$ on the interval $(-\infty, -1] \cup [0, \infty)$ .			
For each polynomial, the degree is lis the polynomial has. 7. The degree is 5 with real zeros at x = -5, x = 1, and x = 4. 5-3 real = 2 non-real zeros	8. The degree is 6 x = -12 and 6 - 2	with real zeros at $x = 7$ .	d the number of NON-REAL zeros 9. The degree is 8 with real zeros at x = 0, x = 2,  and  x = 3. x = 2 has a multiplicity of 4. 8-2-4= 2 non-real zeros
10. The degree is 16 with real zeros at $x = -2$ and $x = 10$ . $x = -2$ has a multiplicity of 5. <b>6 - 6 - 5 =</b> 10 non-real zeros	11. The degree is 12 with real zeros at $x = 14$ , $x = -6$ , and $x = -10$ . $x = 14$ has a multiplicity of 6. x = 14 has a multiplicity of 6. x = -2 - 6 = 4 non-real zeros		12. The degree is 50 with real zeros at $x = 7$ and $x = 8$ . $x = 8$ has a multiplicity of 19. 50 - 1 - 19 30 non-real

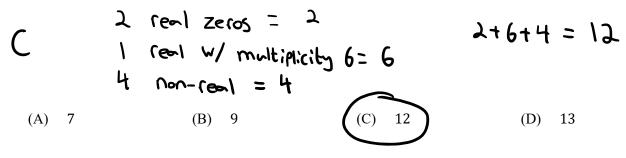


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21. A polynomial function has 3 real zeros and 4 non-real zeros. One of the real zeros has a multiplicity of 6. What is the degree of the polynomial?



22. No calculator allowed! The polynomial function g is given by  $g(x) = (x - 6)(x^2 + 2x + 2)$ . Which of the following describes the zeros of g?

