Finite differences and families of polynomial functions worksheet – Grade 12

Grade 12 · Mixed level · 20 questions · **Version X3831**

Name: _____ Date: _____ Score: ___ / 20

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1. The table shows values of a polynomial function. x: −1, 0, 1, 2, 3, 4; y: 1, 0, −1, −2, −3, −4. What is the degree of the function?

   Answer: _____

2. The table shows values of a polynomial function. x: −1, 0, 1, 2, 3, 4; y: 8, 5, 2, −1, −4, −7. What is the degree of the function?

   Answer: _____

3. The table shows values of a polynomial function. x: 0, 1, 2, 3, 4, 5; y: −5, −3, −5, −11, −21, −35. What is the degree of the function?

   Answer: _____

4. The table shows values of a polynomial function. x: 1, 2, 3, 4, 5, 6; y: 3, −4, −35, −108, −241, −452. What is the degree of the function?

   Answer: _____

5. The table shows values of a polynomial function. x: −1, 0, 1, 2, 3, 4; y: 3, 2, −3, −12, −25, −42. What is the degree of the function?

   Answer: _____

6. The table shows values of a polynomial function. x: −1, 0, 1, 2, 3, 4; y: 2, 3, 12, 29, 54, 87. What is the degree of the function?

   Answer: _____

7. The table shows values of a polynomial function. x: −3, −2, −1, 0, 1, 2; y: 105, 38, 7, 0, 5, 10. What is the degree of the function?

   Answer: _____

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8. For $f(x) = 4x^2 - x + 3$, what is the value of the constant second differences for x = 0, 1, 2, ...?

   Answer: _____

9. The table shows values of a polynomial function. x: 1, 2, 3, 4, 5, 6; y: 9, 20, 35, 54, 77, 104. What is the leading coefficient?

   Answer: _____

10. For $f(x) = -2x^2 - 6x$, what is the value of the constant second differences for x = 0, 1, 2, ...?

    Answer: _____

11. The table shows values of a polynomial function. x: −1, 0, 1, 2, 3, 4; y: −4, 2, 6, 8, 8, 6. What is the leading coefficient?

    Answer: _____

12. The table shows values of a polynomial function. x: 0, 1, 2, 3, 4, 5; y: 1, 8, 33, 88, 185, 336. What is the leading coefficient?

    Answer: _____

13. For $f(x) = 2x^4 + 3x^3 - 3x^2 + x - 2$, what is the value of the constant fourth differences for x = 0, 1, 2, ...?

    Answer: _____

14. The table shows values of a polynomial function. x: 1, 2, 3, 4, 5, 6; y: −5, −27, −67, −131, −225, −355. What is the leading coefficient?

    Answer: _____

15. A member of the family $y = k(x + 6)(x - 3)(x + 2)$ passes through (0, 72). What is its y-intercept?

    Answer: _____

16. A polynomial function has zeros −5, 5, 3, −1 and no others, is of degree 4, and its graph passes through (6, 924). If $y = k(x + 5)(x - 5)(x - 3)(x + 1)$, what is k?

    Answer: _____

17. A polynomial function has zeros −2, 0 and no others, is of degree 2, and its graph passes through (−4, 40). If $y = k(x + 2)(x)$, what is k?

    Answer: _____

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18. A polynomial function has zeros 5, 4, 1, −5 and no others, is of degree 4, and its graph passes through (−3, −896). If $y = k(x-5)(x-4)(x-1)(x+5)$, what is k?

    Answer: _____

19. A polynomial function has zeros 3, 1 and no others, is of degree 2, and its graph passes through (7, −24). If $y = k(x-3)(x-1)$, what is k?

    Answer: _____

20. A member of the family $y = k(x+3)(x-3)$ passes through (−2, 5). What is its y-intercept?

    Answer: _____

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Answer key · Version X3831

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1. **1**
2. **1**
3. **2**
4. **3**
5. **2**
6. **2**
7. **3**
8. **8**
9. **2**
10. **-4**
11. **-1**
12. **2**
13. **48**
14. **-1**
15. **72**
16. **4**
17. **5**
18. **2**
19. **-1**
20. **9**

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