Math 3 - Mr. Nevola   Name_____ ID: 1

Unit 2: Polynomials TEST Review   Date_____ Period____

Name each polynomial by degree and number of terms.

1) 6

constant monomial

2) $10x^3 + 1 - 4x^2$

cubic trinomial

3) $-2n^3 - 2$

cubic binomial

4) $-6r^2 + 6$

quadratic binomial

Simplify each sum.

5) $(7n^2 + 2n - 4) + (5n^2 + 7 - 3n)$

$12n^2 - n + 3$

6) $(6p - 5p^3 - 4) + (4 - 6p^3 - 3p)$

$-11p^3 + 3p$

7) $(3n^3 + 7n + 2) + (n - 7 - 7n^3)$

$-4n^3 + 8n - 5$

8) $(3x^3 - 5x^2 + 2x) + (7x^2 + 3x^3 - x)$

$6x^3 + 2x^2 + x$

Simplify each difference.

9) $(7v^2 + 6v^4 - 3v) - (6v^4 - 8v^2 + 7v)$

$15v^2 - 10v$

10) $(3n^3 + 4n^2 + 2n^4) - (n^3 - 7n^2 - 4n^4)$

$6n^4 + 2n^3 + 11n^2$

11) $(8n^3 - 6n^2 + 4n) - (8n^3 + 2n^2 - 8n)$

$-8n^2 + 12n$

12) $(4n + 8n^4 - 3) - (3n^4 + 3 + 6n)$

$5n^4 - 2n - 6$

Find each product.

13) $(4p + 2)(p + 3)$

$4p^2 + 14p + 6$

14) $(b - 7)(b - 1)$

$b^2 - 8b + 7$

Divide.

15) $(4n^2 - 9n - 1) \div (n - 2)$

$4n - 1 - \dfrac{3}{n - 2}$

16) $(6n^2 - 18n + 8) \div (n - 2)$

$6n - 6 - \dfrac{4}{n - 2}$

17) $(x^3 + 15x^2 + 48x - 48) \div (x + 7)$

$x^2 + 8x - 8 + \dfrac{8}{x + 7}$

18) $(m^3 - 9m^2 - 7) \div (m - 9)$

$m^2 - \dfrac{7}{m - 9}$

19) $\left(7m^3 + 42m^2 + 6\right) \div \left(m + 6\right)$

$7m^2 + \dfrac{6}{m + 6}$

20) $\left(x^3 + x^2 - 63x - 57\right) \div \left(x + 8\right)$

$x^2 - 7x - 7 - \dfrac{1}{x + 8}$

State if the given binomial is a factor of the given polynomial.

21) $\left(b^3 - 11b^2 + 18b + 48\right) \div \left(b - 8\right)$

Yes

22) $\left(3a^3 + 16a^2 - 61a + 32\right) \div \left(a + 8\right)$

No

Describe the end behavior of each function.

23) $f(x) = -x^3 + 2x^2 + 1$

*A) Rises to the left. Falls to the right
 B) Rises to the left. Rises to the right
 C) Falls to the left. Falls to the right
 D) Falls to the left. Rises to the right

24) $f(x) = -x^5 + 4x^3 - x + 2$

 A) Falls to the left. Rises to the right
 B) Falls to the left. Falls to the right
*C) Rises to the left. Falls to the right
 D) Rises to the left. Rises to the right

25) $f(x) = -x^2 + 8x - 12$

 A) Falls to the left. Rises to the right
 B) Rises to the left. Falls to the right
 C) Rises to the left. Rises to the right
*D) Falls to the left. Falls to the right

26) $f(x) = -2x^2 - 1$

 A) Rises to the left. Falls to the right
 B) Rises to the left. Rises to the right
*C) Falls to the left. Falls to the right
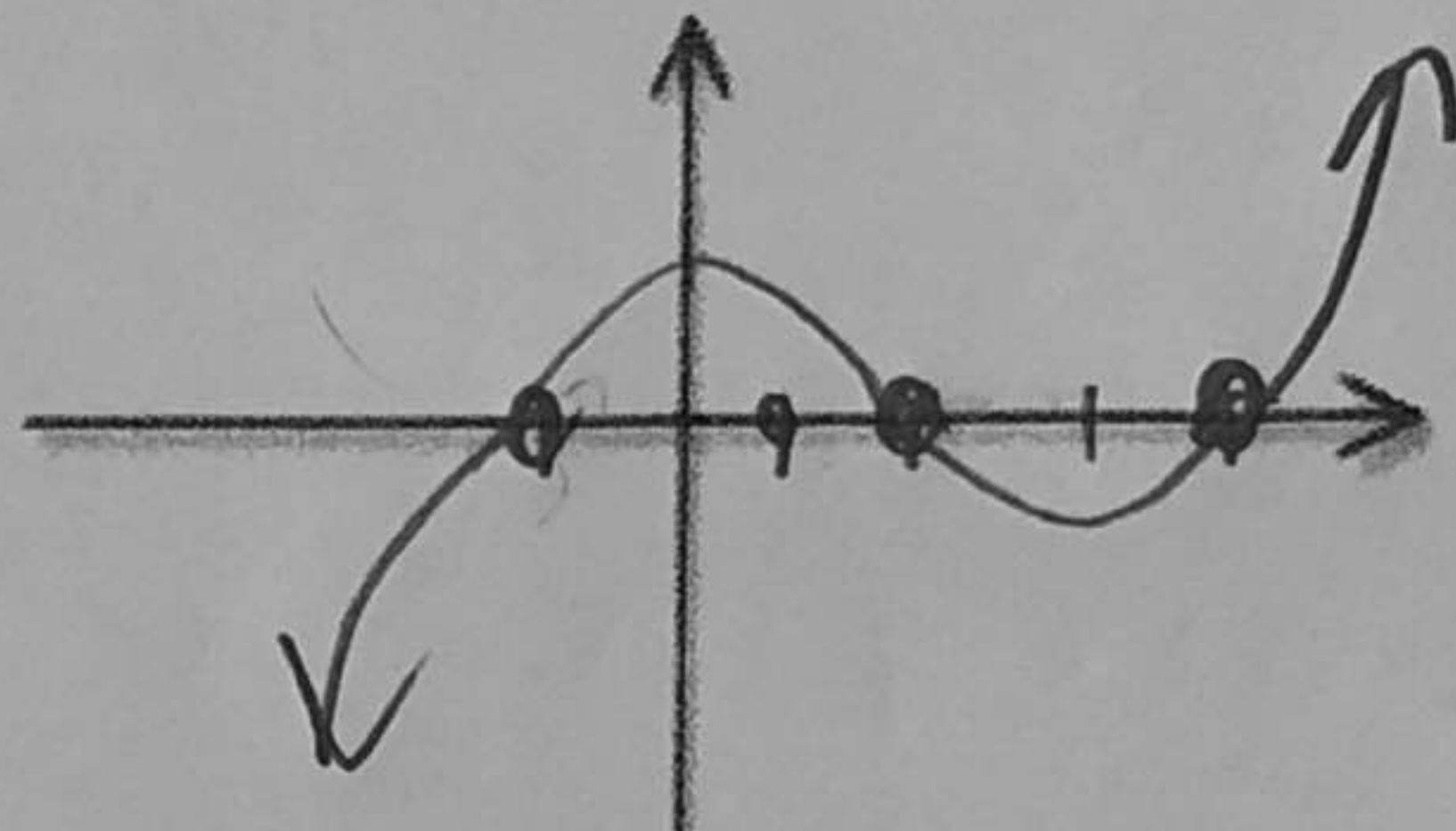 D) Falls to the left. Rises to the right

Sketch the graph of each function.

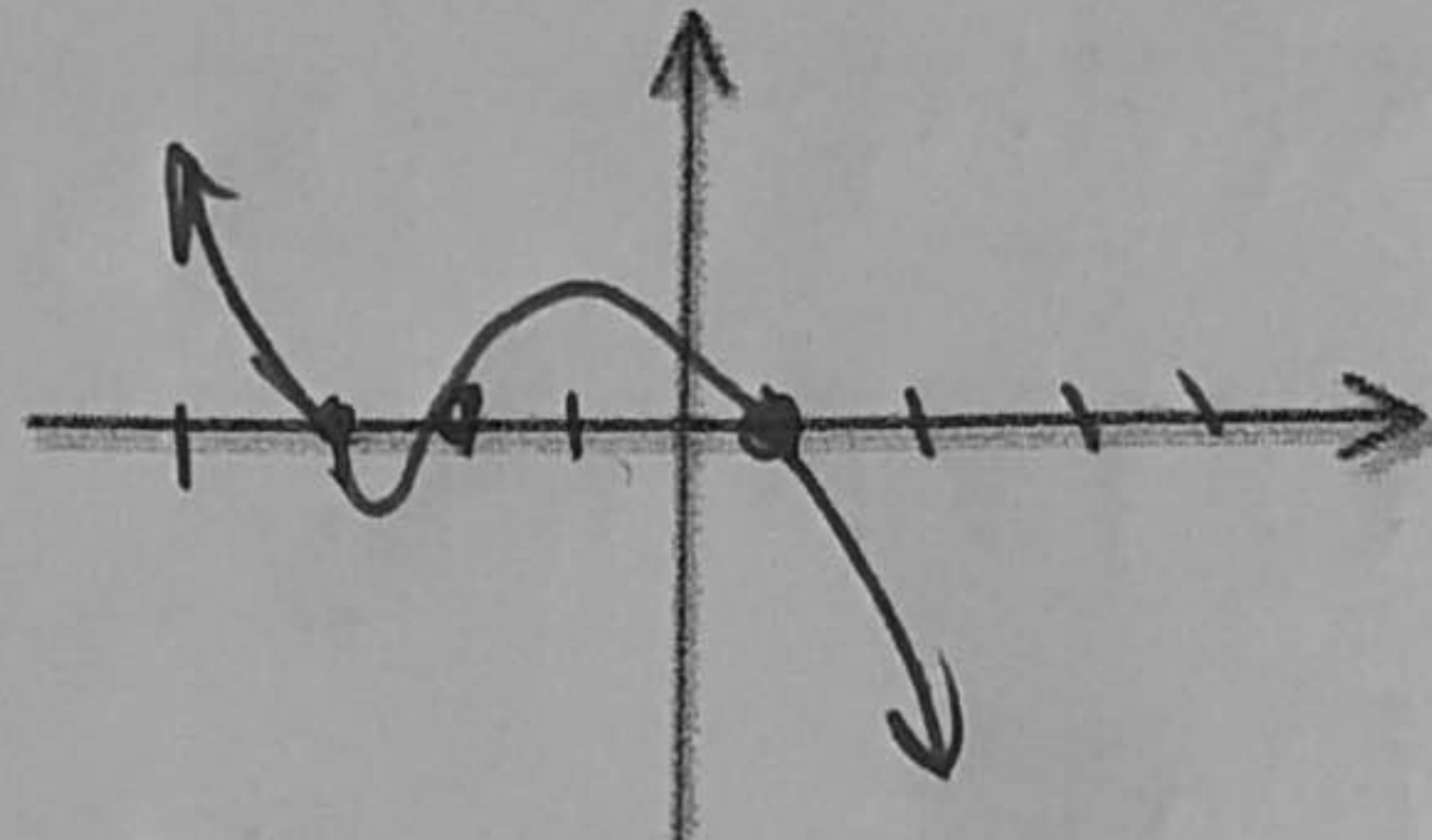27. $f(x) = (x + 1)(x - 2)(x - 4)$

LT: x^3

End: ↙ ↗

zeroes=

-1, 2, 4

28. $f(x) = -(x + 3)(x + 2)(x - 1)^3$
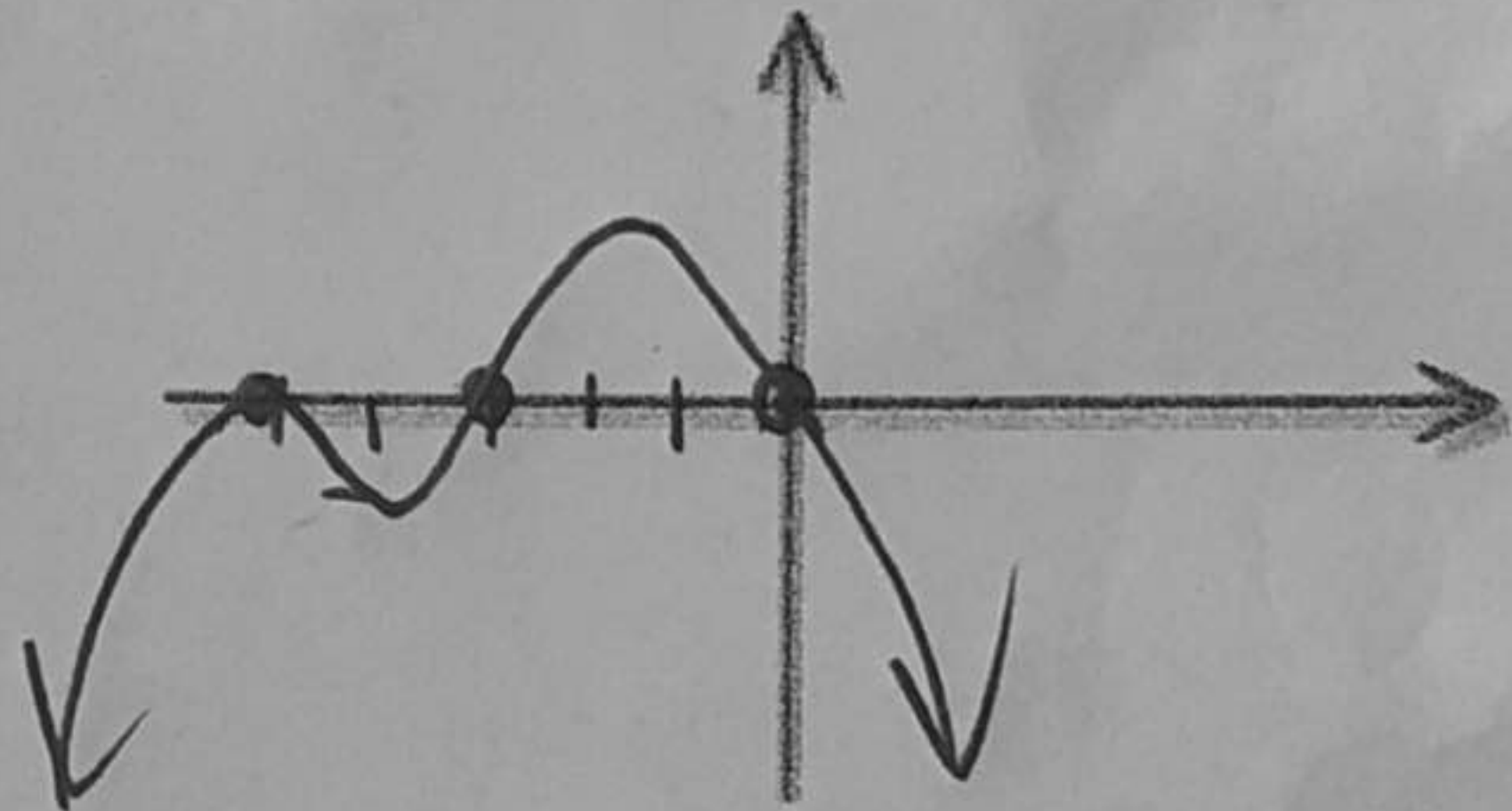
LT: $-x^5$

End: ↖ ↘

zeroes: -3, -2, 1

29. $f(x) = -x(x + 5)^2(x + 3)$

LT: $-x^4$
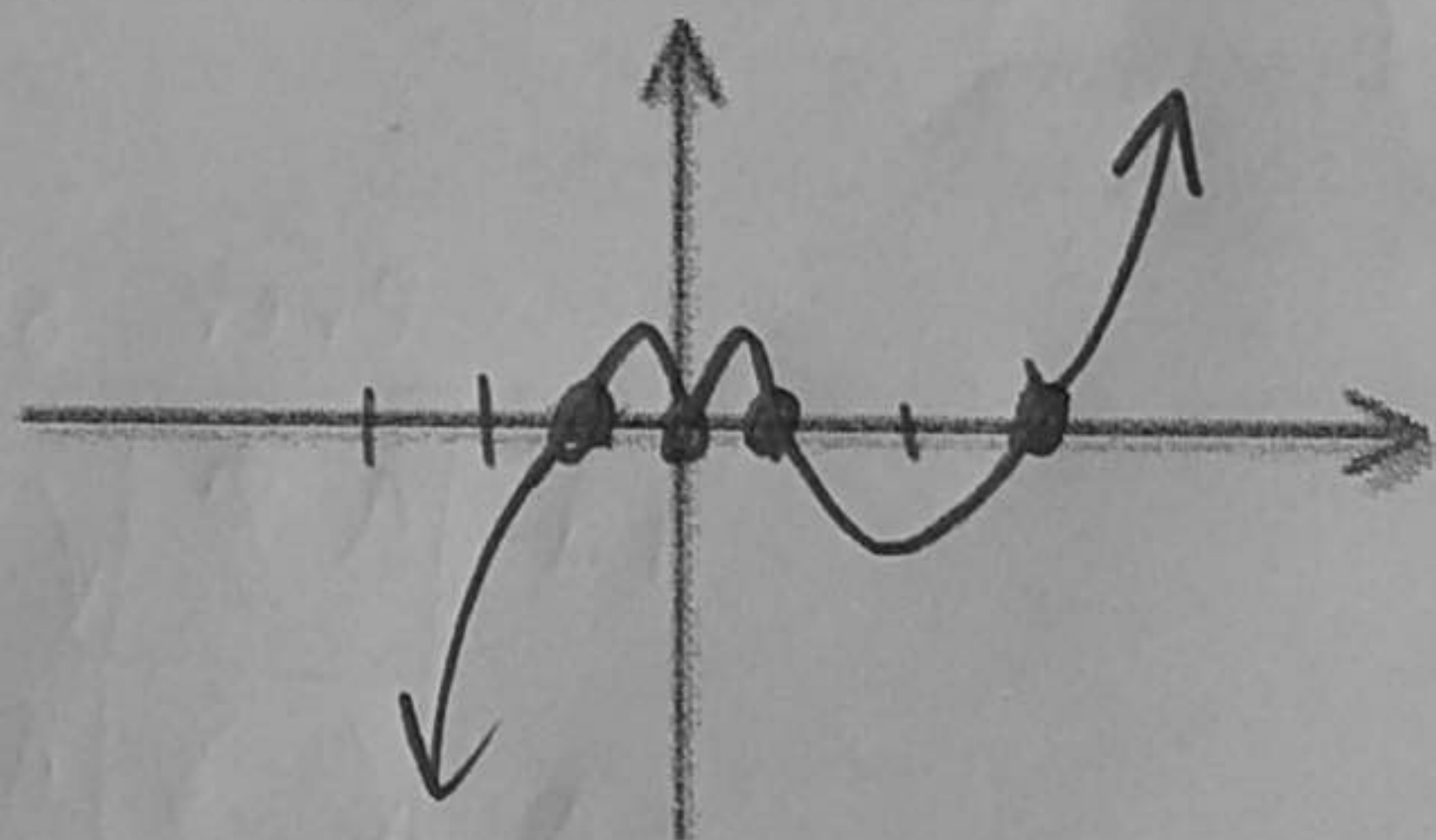
End: ↙ ↘

zeroes: -5, -3, 0

30. $y = x^2(x-3)(x-1)(x+1)$
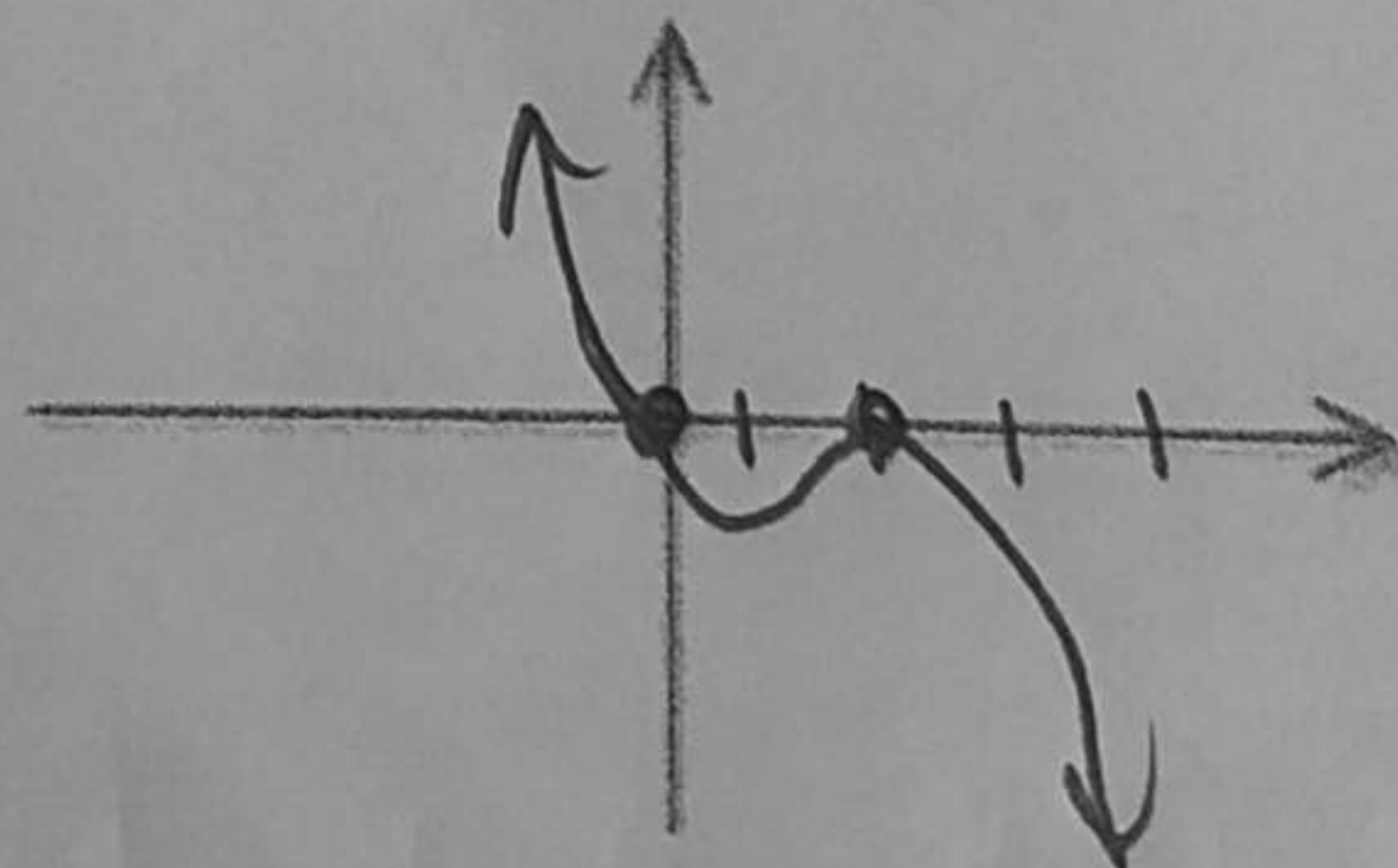
LT: x^5

End: ↙ ↗

zeroes: 0, 3, 1, -1

31. $y = -x^3(x-2)^2$
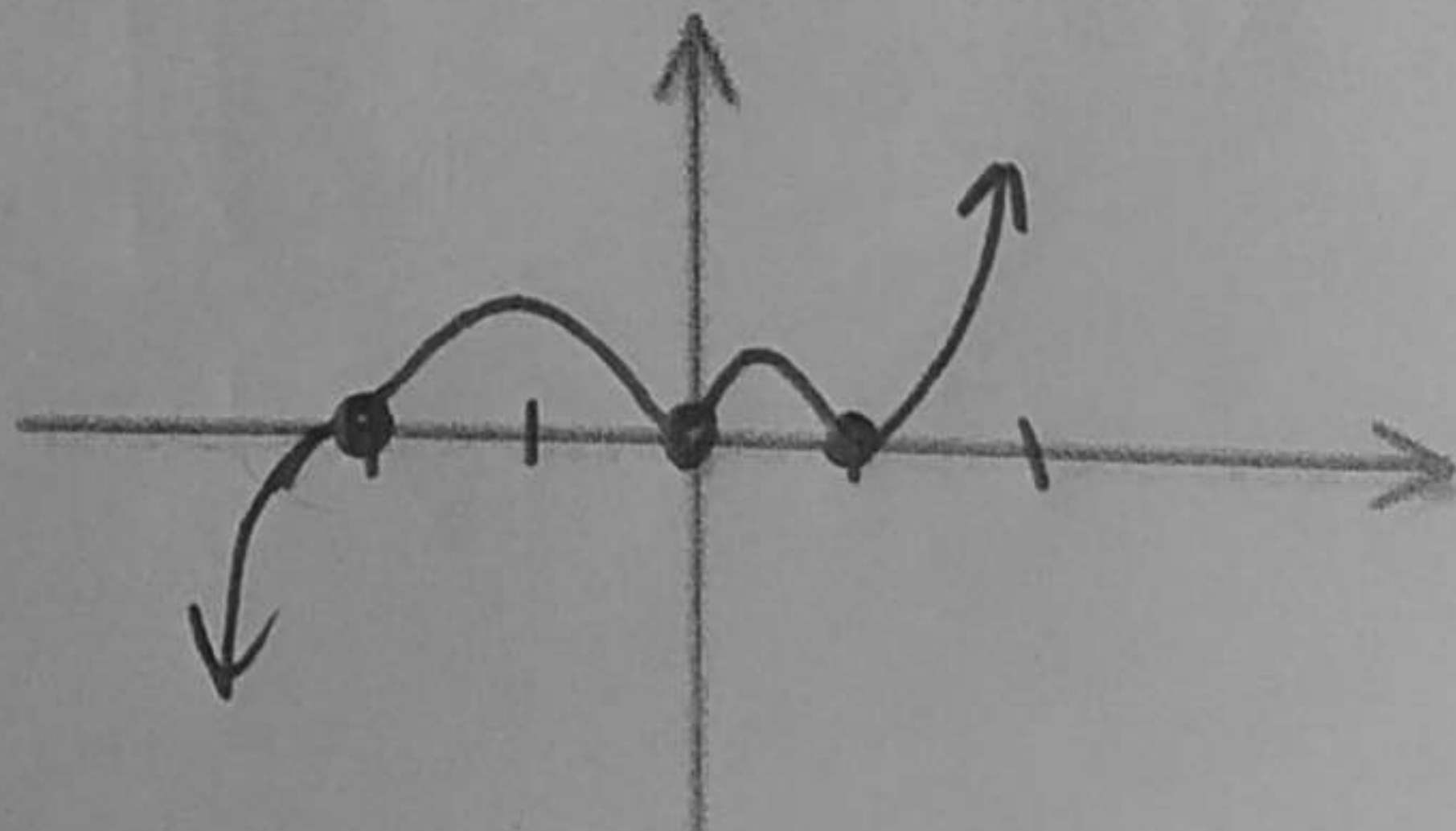
LT: $-x^5$

End: ↖ ↘

zeroes: 0, 2

32. $f(x) = x^2(x - 1)^2(x+2)$

LT: x^5

End: ↙ ↗

zeroes: 0, 1, -2

17.

Create the equation of the cubic, in standard form, that has x-intercepts of −4, 2, and 5 and passes through the point $(6, 20)$. Verify your answer by sketching the cubic's graph on the axes below.
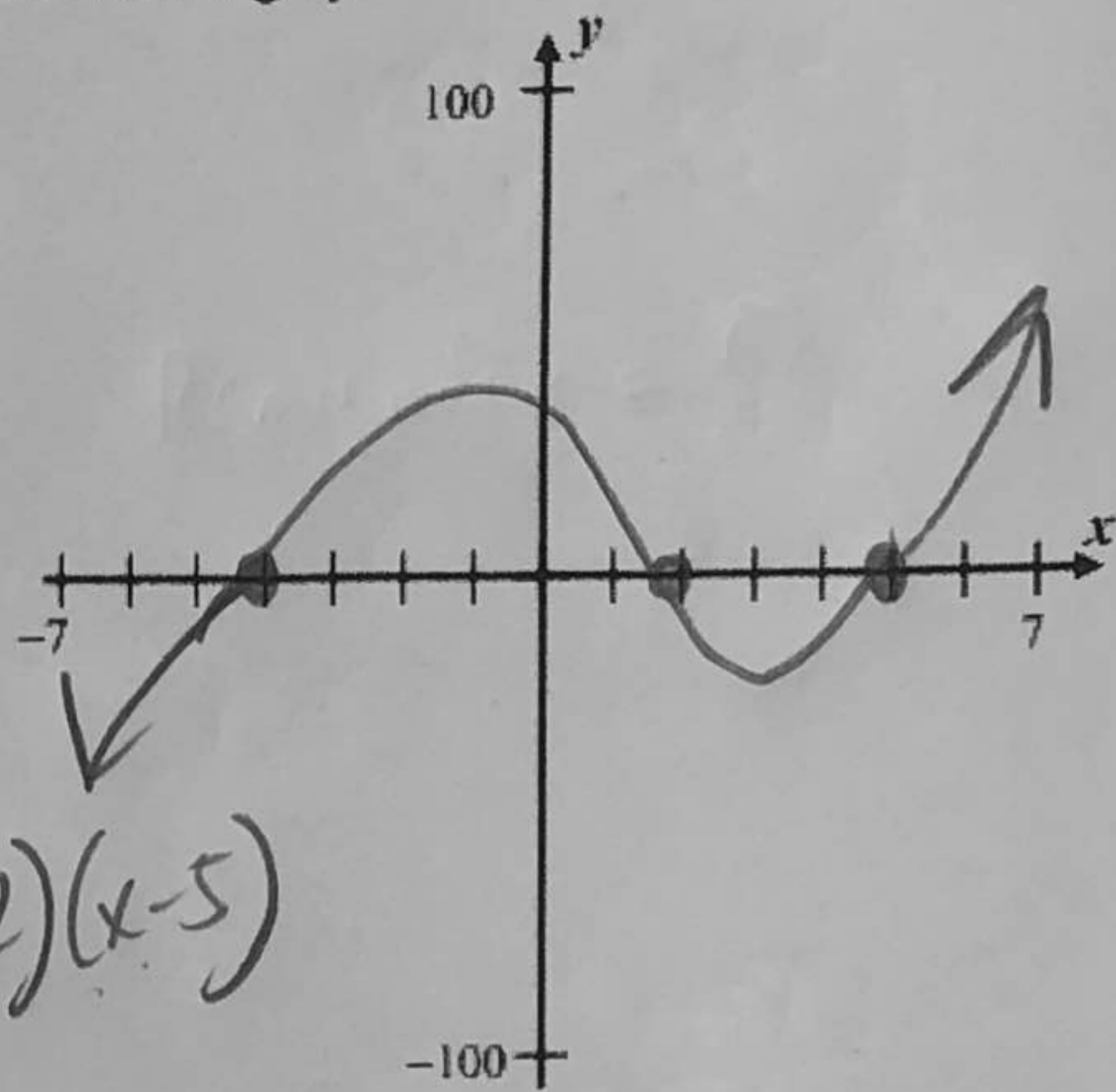
$$y = a(x+4)(x-2)(x-5)$$

$$20 = a(6+4)(6-2)(6-5)$$

$$20 = a(10)(4)(1)$$

$$\frac{20}{40} = \frac{40a}{40}$$

$$\frac{1}{2} = a$$

$$y = \frac{1}{2}(x+4)(x-2)(x-5)$$

18.

Create an equation for a cubic function, in standard form, that has x-intercepts given by the set $\{-3, 1, 7\}$ and which passes through the point $(-2, 54)$. Sketch your result on the axes shown below.

$$y = a(x+3)(x-1)(x-7)$$

$$54 = a(-2+3)(-2-1)(-2-7)$$

$$54 = a(1)(-3)(-9)$$

$$\frac{54}{27} = \frac{27a}{27}$$

$$a = 2$$

$$y = 2(x+3)(x-1)(x-7)$$