

**Assignment**

Date \_\_\_\_\_ Period \_\_\_\_\_

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**Approximate the relative minima and relative maxima of each function to the nearest tenth.**

1)  $f(x) = x^4 - 3x^3 - x^2 + 7x$

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

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

4)  $f(x) = x^3 - 2x^2$

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

**State the actual number of real zeros of each function.**

6)  $f(x) = x^4 - x^3 - x^2 - 3$

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

$$8) f(x) = -x^5 + 3x^3 - 3x - 2$$

$$9) f(x) = -x^3 + 3x^2 + 2$$

$$10) f(x) = -x^5 + 4x^3 - 5x$$

**Approximate the real zeros of each function to the nearest tenth.**

$$11) f(x) = x^4 - 2x^2 + x + 1$$

$$12) f(x) = x^5 - 4x^3 + 2x + 2$$

$$13) f(x) = -x^3 - 5x^2 - 3x + 2$$

$$14) f(x) = -x^4 + x^2 - 3$$

$$15) f(x) = x^3 - 4x^2 + 3$$

**State the maximum number of turns the graph of each function could make.**

$$16) f(x) = -x^4 + x^2 - x + 4$$

$$17) f(x) = x^4 - x^2 + x + 4$$

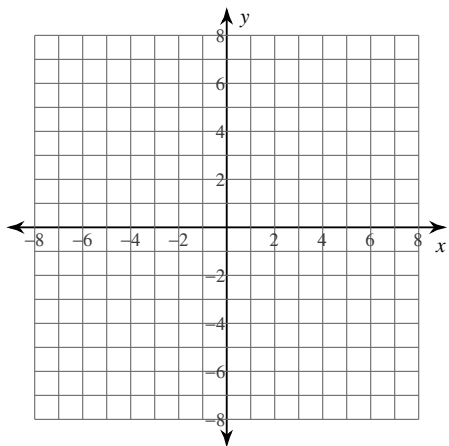
$$18) f(x) = x^3 + 11x^2 + 40x + 49$$

$$19) f(x) = x^5 - 4x^3 + 3x - 2$$

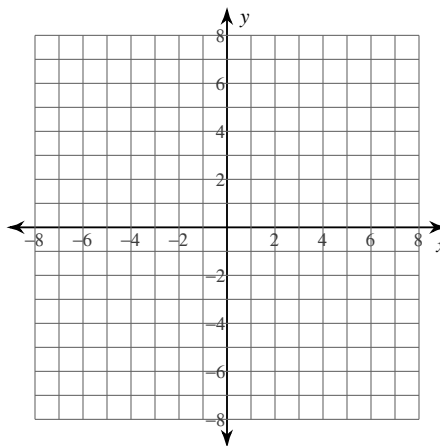
$$20) f(x) = x^5 - 4x^3 + 4x + 4$$

Sketch the graph of each function. Approximate each real zero to the nearest tenth. Approximate the relative minima and relative maxima to the nearest tenth. State the domain and range.

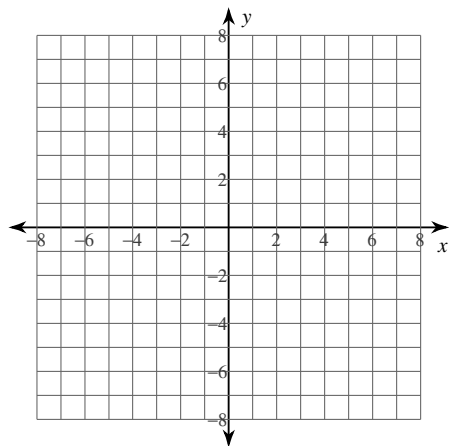
21)  $f(x) = -x^4 + 2x^3 + 2x^2 - 5$



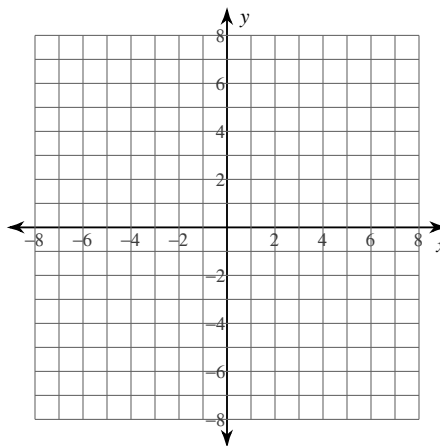
22)  $f(x) = x^4 - 4x^2 - x + 4$



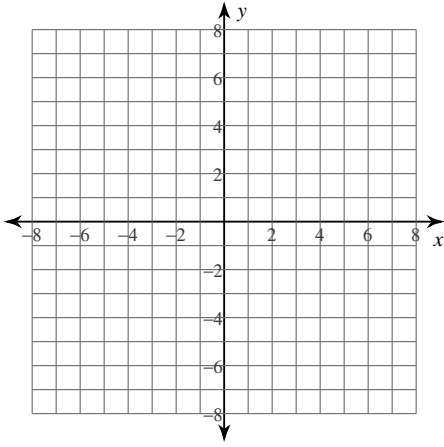
23)  $f(x) = -x^4 + 3x^2 + 3x$



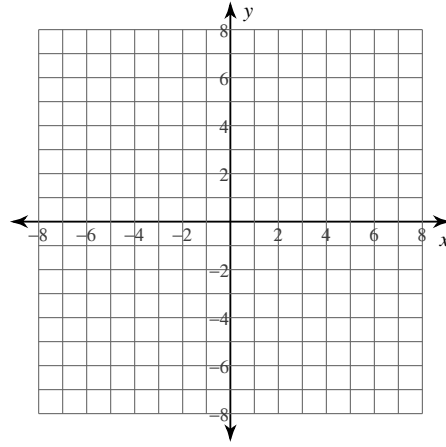
24)  $f(x) = x^3 - 6x^2 + 9x - 7$



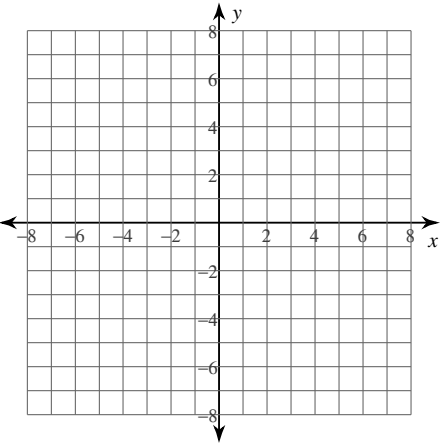
25)  $f(x) = -x^3 - 4 + 3x$



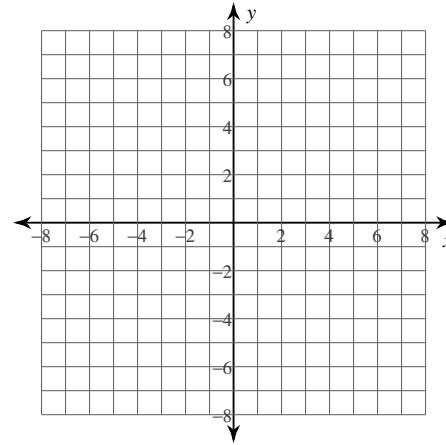
26)  $f(x) = -x^4 + x^2 - x + 3$



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

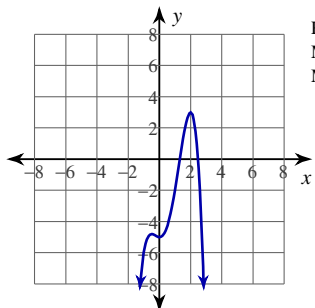


28)  $f(x) = x^3 - 2x^2$

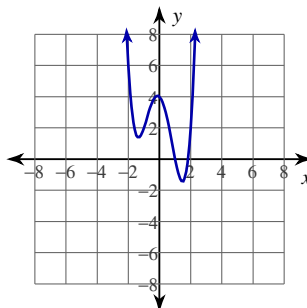


# Answers to Assignment (ID: 1)

- |                                     |                                    |                                   |
|-------------------------------------|------------------------------------|-----------------------------------|
| 1) Minima: $(-0.8, -4.3), (2.1, 2)$ | 2) Minima: $(-1, 3)$               | 3) Minima: None                   |
| Maxima: $(1, 4)$                    | Maxima: $(0.3, 4.2)$               | Maxima: $(1.9, 4.1)$              |
| 4) Minima: $(1.3, -1.2)$            | 5) Minima: $(-1.1, -5.1), (0, -4)$ | 6) # Real Zeros: 2                |
| Maxima: $(0, 0)$                    | Maxima: $(0, -4), (1.1, -2.9)$     |                                   |
| 7) # Real Zeros: 1                  | 8) # Real Zeros: 1                 | 9) # Real Zeros: 1                |
| 10) # Real Zeros: 1                 |                                    |                                   |
| 11) Real Zeros: $-1.5, -0.5$        | 12) Real Zeros: $-1.9, 1.2, 1.7$   | 13) Real Zeros: $-4.2, -1.2, 0.4$ |
| 14) Real Zeros: None                | 15) Real Zeros: $-0.8, 1, 3.8$     | 16) Max # Turns: 3                |
| 17) Max # Turns: 3                  | 18) Max # Turns: 2                 | 19) Max # Turns: 4                |
|                                     |                                    | 20) Max # Turns: 4                |
| 21)                                 |                                    | 22)                               |

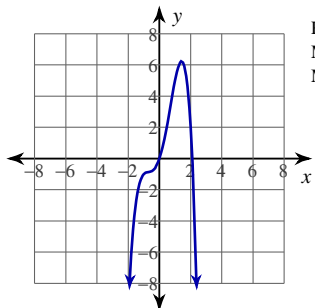


Real Zeros: 1.3, 2.5  
 Minima:  $(0, -5)$   
 Maxima:  $(-0.5, -4.8)$   
 $(2, 3)$



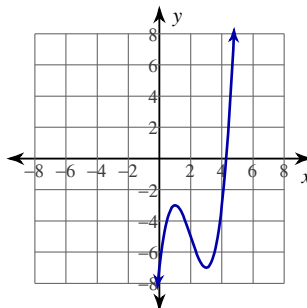
Real Zeros: 1, 1.8  
 Minima:  $(-1.3, 1.4)$   
 $(1.5, -1.4)$   
 Maxima:  $(-0.1, 4.1)$

23)



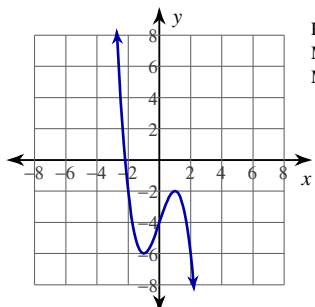
Real Zeros: 0, 2.1  
 Minima: None  
 Maxima:  $(1.4, 6.2)$

24)



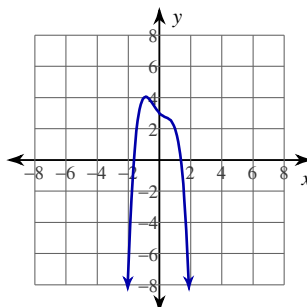
Real Zeros: 4.3  
 Minima:  $(3, -7)$   
 Maxima:  $(1, -3)$

25)



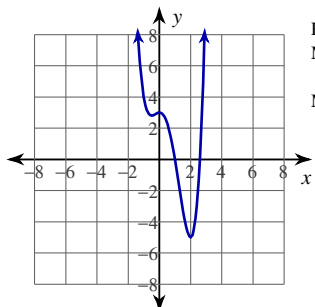
Real Zeros:  $-2.2$   
 Minima:  $(-1, -6)$   
 Maxima:  $(1, -2)$

26)



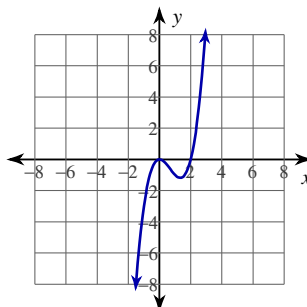
Real Zeros:  $-1.6, 1.4$   
 Minima: None  
 Maxima:  $(-0.9, 4.1)$

27)



Real Zeros: 1, 2.6  
 Minima:  $(-0.5, 2.8)$   
 $(2, -5)$   
 Maxima:  $(0, 3)$

28)



Real Zeros: 0, 2  
 Minima:  $(1.3, -1.2)$   
 Maxima:  $(0, 0)$