

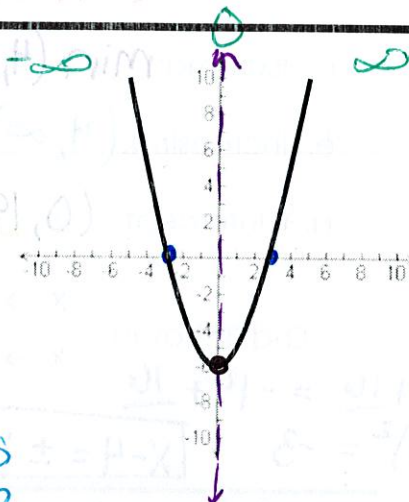
Name: hey

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Characteristics of Functions

1.

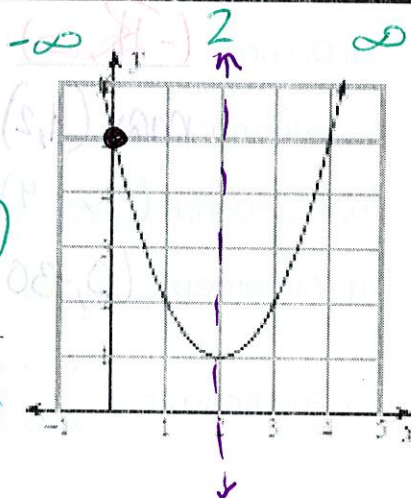
- a. Domain: $(-\infty, \infty)$
- b. Range: $[-6, \infty)$
- c. Extrema: min $(0, -6)$
- d. Axis of Sym: $x=0$
- e. Increasing: $(0, \infty)$
- f. Decreasing: $(-\infty, 0)$
- g. Y-Intercept: $(0, -6)$
- h. Solutions: $x=3, -3$



- i. End Behavior: $x \rightarrow +\infty \quad f(x) \rightarrow \infty$
- $x \rightarrow -\infty \quad f(x) \rightarrow \infty$

2.

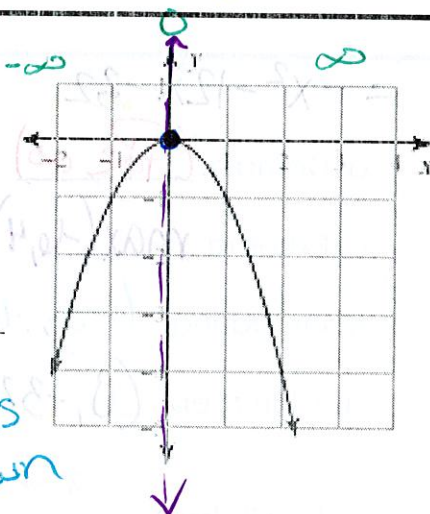
- a. Domain: $(-\infty, \infty)$
- b. Range: $[1, \infty)$
- c. Extrema: min $(2, 1)$
- d. Axis of Sym: $x=2$
- e. Increasing: $(2, \infty)$
- f. Decreasing: $(-\infty, 2)$
- g. Y-Intercept: $(0, 5)$
- h. Solutions: no real



- i. End Behavior: $x \rightarrow +\infty \quad f(x) \rightarrow \infty$
- $x \rightarrow -\infty \quad f(x) \rightarrow \infty$

3.

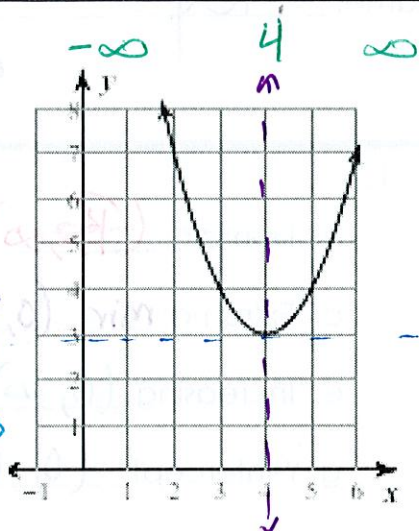
- a. Domain: $(-\infty, \infty)$
- b. Range: $(-\infty, 0]$
- c. Extrema: max $(0, 0)$
- d. Axis of Sym: $x=0$
- e. Increasing: $(-\infty, 0)$
- f. Decreasing: $(0, \infty)$
- g. Y-Intercept: $(0, 0)$
- h. Solutions: x-int $(0, 0)$



- i. End Behavior: $x \rightarrow +\infty \quad f(x) \rightarrow -\infty$
- $x \rightarrow -\infty \quad f(x) \rightarrow -\infty$

4. $X^2 - 8X + 19$

- a. Domain: $(-\infty, \infty)$
- b. Range: $[3, \infty)$
- c. Extrema: $\text{min}(4, 3)$
- d. Axis of Sym: $X = 4$
- e. Increasing: $(4, \infty)$
- i. Decreasing: $(-\infty, 4)$
- g. Y-Intercept: $(0, 19)$
- h. Solutions: $X = 4 \pm i\sqrt{3}$



- i. End Behavior: $X \rightarrow +\infty \quad f(x) \rightarrow \infty$
- $X \rightarrow -\infty \quad f(x) \rightarrow \infty$

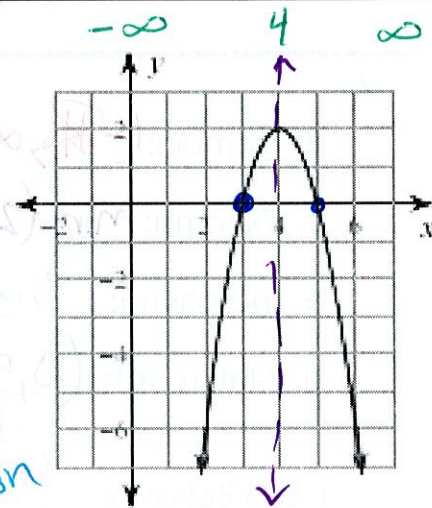
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$X^2 - 8X + 16 = -19 + 16$

$(X-4)^2 = -3 \quad \boxed{X-4 = \pm i\sqrt{3}}$

5. $= -2X^2 + 16X - 30$

- a. Domain: $(-\infty, \infty)$
- b. Range: $(-\infty, 2]$
- c. Extrema: $\text{max}(4, 2)$
- d. Axis of Sym: $X = 4$
- e. Increasing: $(-\infty, 4)$
- f. Decreasing: $(4, \infty)$
- g. Y-Intercept: $(0, -30)$
- h. Solutions: $(3, 0), (5, 0)$

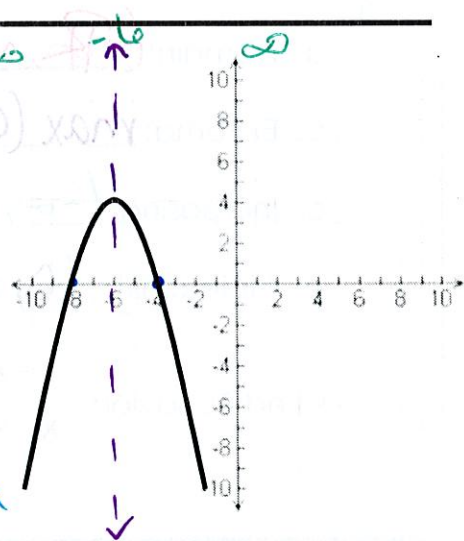


- i. End Behavior: $X \rightarrow +\infty \quad f(x) \rightarrow -\infty$
- $X \rightarrow -\infty \quad f(x) \rightarrow -\infty$

opens down

6. $= -X^2 - 12X - 32$

- a. Domain: $(-\infty, \infty)$
- b. Range: $(-\infty, 4]$
- c. Extrema: $\text{max}(-6, 4)$
- d. Axis of Sym: $X = -6$
- e. Increasing: $(-\infty, -6)$
- f. Decreasing: $(-6, \infty)$
- g. Y-Intercept: $(0, -32)$
- h. Solutions: $X = -4, -8$



- i. End Behavior: $X \rightarrow +\infty \quad f(x) \rightarrow -\infty$
- $X \rightarrow -\infty \quad f(x) \rightarrow -\infty$

opens down