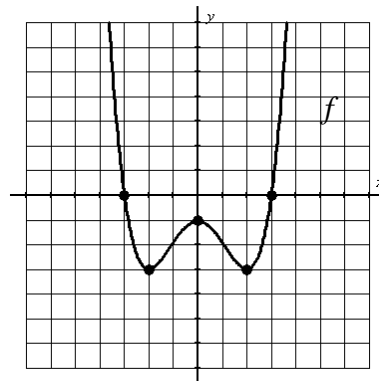
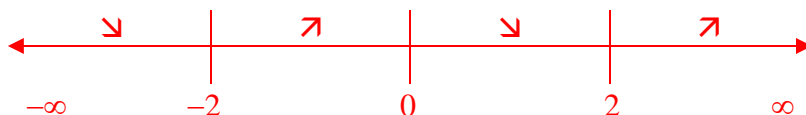


For the polynomial function $f(x)$ shown at the right, find the following.



1. domain: $(-\infty, \infty)$; all polynomial functions have a domain of all real numbers
2. range: $[-3, \infty)$; the least y -value in the graph is at the minimums and the graph goes up forever; remember to include -3 with a bracket since the graph touches that point
3. x -int: $(-3, 0)$ and $(3, 0)$; remember to write the intercepts as coordinates
4. y -int: $(0, -1)$; remember to write the intercept as coordinates
5. rel min: $(-2, -3)$ and $(2, -3)$; these are the points at the bottom of the “valleys”; remember to write the relative minimums as coordinates
6. rel max: $(0, -1)$; this is the point at the top of the “hill”; remember to write the relative maximum as coordinates
7. inc: $(-2, 0) \cup (2, \infty)$; remember to use x 's in the interval notation (*not* y 's); you might find it helpful to create a number line using the x -coordinates of the relative minimums and maximum (see below)

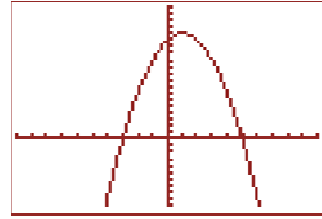


8. dec: $(-\infty, -2) \cup (0, 2)$; remember to use x 's in the interval notation (*not* y 's)
9. left e.b.: $x \rightarrow -\infty, f(x) \rightarrow \infty$; the first statement means “as x goes left toward negative infinity” and the second statement means “then y goes up toward positive infinity”
10. right e.b.: $x \rightarrow \infty, f(x) \rightarrow \infty$; the first statement means “as x goes right toward positive infinity” and the second statement means “then y goes up toward positive infinity”

NOTE: Since #11-14 are not represented on the quiz, those problems have been omitted here.

For the function $g(x) = 15 + 2x - x^2$, find the following.

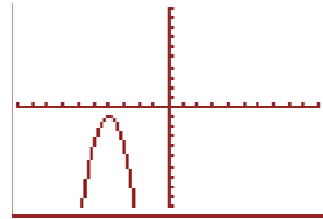
While not necessary, it will help to graph the function. The window shown here has had its “Ymin” increased to see the top of the parabola.



15. domain: $(-\infty, \infty)$
16. range: $(-\infty, 16]$
17. vertex (min/max?): $(1, 16)$ is a maximum
18. x-int: $(-3, 0)$ and $(5, 0)$
19. y-int: $(0, 15)$
20. AOS: $x = 1$; this is the vertical line that passes through the vertex
21. inc: $(-\infty, 1)$; remember this is an interval in terms of x
22. dec: $(1, \infty)$; remember this is an interval in terms of x
22. concavity: downward; this term just means if the parabola is opening up or down
23. left e.b.: $x \rightarrow -\infty, g(x) \rightarrow -\infty$
24. right e.b.: $x \rightarrow \infty, g(x) \rightarrow -\infty$

For the function $h(x) = -3(x+4)^2 - 1$, find the following.

While not necessary, it will help to graph the function. The window here shows the parabola in the standard viewing setting.



15. domain: $(-\infty, \infty)$
16. range: $(-\infty, -1]$
17. vertex (min/max?): $(-4, -1)$ is a maximum
18. x-int: *none*
19. y-int: $(0, -49)$
20. AOS: $x = -4$; this is the vertical line that passes through the vertex
21. inc: $(-\infty, -4)$; remember this is an interval in terms of x
22. dec: $(-4, \infty)$; remember this is an interval in terms of x
22. concavity: downward; this term just means if the parabola is opening up or down
23. left e.b.: $x \rightarrow -\infty, g(x) \rightarrow -\infty$
24. right e.b.: $x \rightarrow \infty, g(x) \rightarrow -\infty$