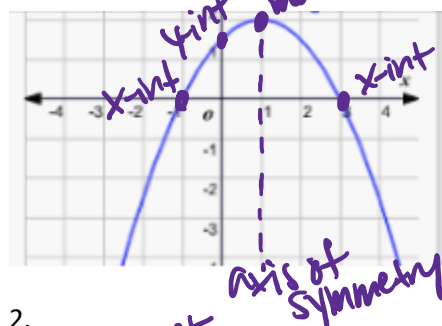


For the problems below, answer the following questions:

- Does the parabola have a maximum or a minimum?
- What is the vertex?
- What is the axis of symmetry?
- What is the y-intercept?
- What are the x-intercepts?
- What is the end behavior?
- For what interval(s) is the graph increasing?
- For what interval(s) is the graph decreasing?
- What is the domain?
- What is the range?
- Where is the graph > 0 ?
- Where is the graph < 0 ?

1.



a) maximum

b) (1, 2)

c) $x = 1$

d) (0, 1.5)

e) (-1, 0) (3, 0)

f) $x \rightarrow -\infty f(x) \rightarrow -\infty$
 $x \rightarrow +\infty f(x) \rightarrow -\infty$

g) inc $(-\infty, 1)$ or $x < 1$

h) dec $(1, \infty)$ or $x > 1$

i) $(-\infty, \infty)$ j) $(-\infty, 2]$ or $y \leq 2$

k) $(-1, 3)$ or $-1 < x < 3$

l) $(-\infty, -1) \cup (3, \infty)$
 $x < -1 \cup x > 3$ or

2.

X	-5	-4	-3	-2	-1	0	1	2	3
Y	0	-14	-24	-30	-32	-30	-24	-14	0

a) min b) (-1, -32) c) $x = -1$ d) (0, -30) e) (-5, 0) (3, 0) f) $x \rightarrow -\infty f(x) \rightarrow \infty$
 $x \rightarrow -\infty f(x) \rightarrow \infty$

g) inc $(-1, \infty)$ or $x > -1$

h) dec $(-\infty, -1)$ or $x < -1$

i) $(-\infty, \infty)$

j) $(-32, \infty)$

$y \geq -32$

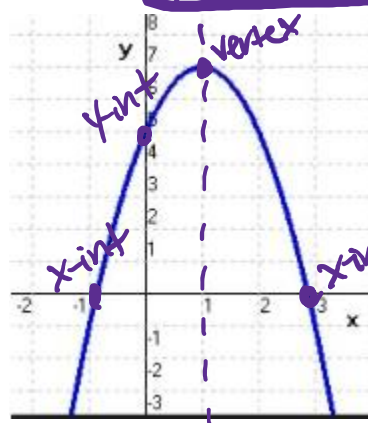
k) $(-\infty, -5) \cup (3, \infty)$

$x < -5 \cup x > 3$

l) $(-5, 3)$

$-5 < x < 3$

3.



a) max

b) (1, 7)

c) $x = 1$

d) (0, 5)

e) (-1, 0) (3, 0)

f) $x \rightarrow -\infty f(x) \rightarrow -\infty$
 $x \rightarrow -\infty f(x) \rightarrow -\infty$

g) inc $(-\infty, 1)$ or $x < 1$

h) dec $(1, \infty)$ or $x > 1$

i) $(-\infty, \infty)$

j) $(-\infty, 7]$ or $y \leq 7$

k) $(-1, 3)$ or $-1 < x < 3$

l) $(-\infty, -1) \cup (3, \infty)$

$x < -1 \cup x > 3$

4.

X	-4	-3	-2	-1	0	1	2	3
Y	14	0	-10	-16	-18	-16	-10	0

a) min

b) $(0, -18)$

c) $x=0$

d) $(0, -18)$

e) $(-3, 0)$ $(3, 0)$

f) $x \rightarrow -\infty, f(x) \rightarrow \infty$

$x \rightarrow +\infty, f(x) \rightarrow \infty$

g) inc $(0, \infty)$ or $x > 0$

h) dec $(-\infty, 0)$ or $x < 0$

i) $(-\infty, \infty)$

j) $[-18, \infty)$ or $x \geq -18$

k) $(-\infty, -3) \cup (3, \infty)$

$x < -3$ or $x > 3$

l) $(-3, 3)$ or $-3 < x < 3$

Answers:

1. a. maximum

b. $(1, 2)$

c. $x = 1$

d. $(0, 1.5)$

e. $(-1, 0)$ $(3, 0)$

f. $x \rightarrow -\infty, y \rightarrow -\infty; x \rightarrow \infty, y \rightarrow -\infty$

g. $x < 1$

h. $x > 1$

i. all real numbers

j. $y \leq 2$

k. $-1 < x < 3$

l. $x < -1 \cup x > 3$

2. a. minimum

b. $(-1, -32)$

c. $x = -1$

d. $(0, 30)$

e. $(-5, 0)$ $(3, 0)$

f. $x \rightarrow -\infty, y \rightarrow \infty; x \rightarrow \infty, y \rightarrow \infty$

g. $x > -1$

h. $x < -1$

i. all real numbers

j. $y \geq -32$

k. $x < -5 \cup x > 3$

l. $-5 < x < 3$

3. a. maximum

b. $(1, 7)$

c. $x = 1$

d. $(0, 5)$

e. approximate based on visual: $(-.8, 0)$ $(2.8, 0)$

f. $x \rightarrow -\infty, y \rightarrow -\infty; x \rightarrow \infty, y \rightarrow -\infty$

g. $x < 1$

h. $x > 1$

i. all real numbers

j. $y \leq 7$

k. $-.8 < x < 2.8$

l. $x < -.8 \cup x > 2.8$

4. a. minimum

b. $(0, -18)$

c. $x = 0$

d. $(0, -18)$

e. $(-3, 0)$ $(3, 0)$

f. $x \rightarrow -\infty, y \rightarrow \infty; x \rightarrow \infty, y \rightarrow \infty$

g. $x > 0$

h. $x < 0$

i. all real numbers

j. $y \geq -18$

k. $x < -3 \cup x > 3$

I. $-3 < x < 3$