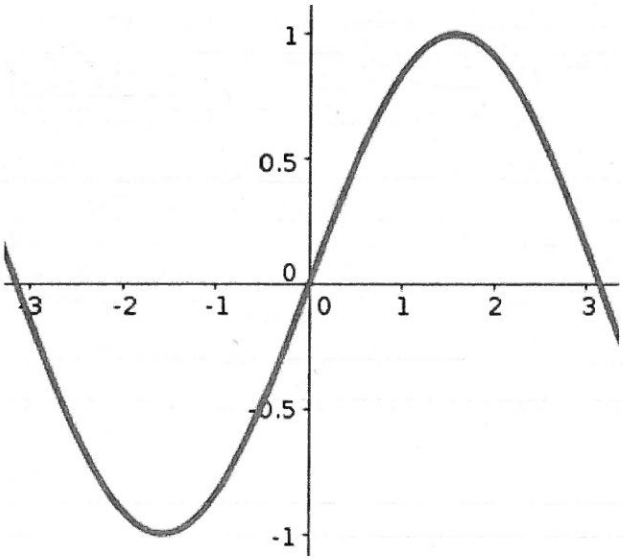
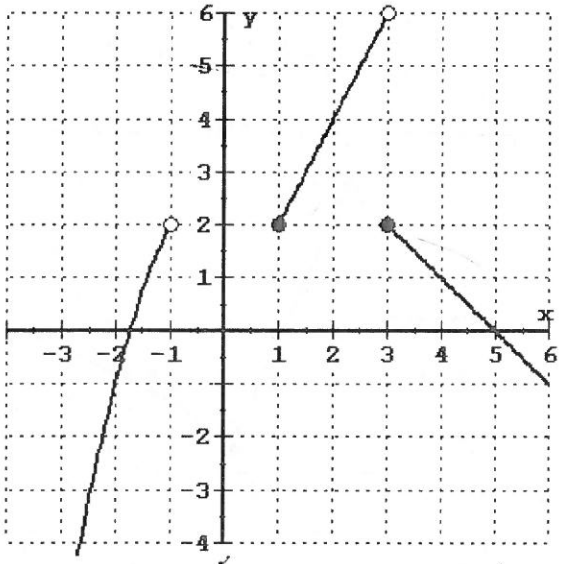
Name: AK Period: Date:

2.3 Practice Problems

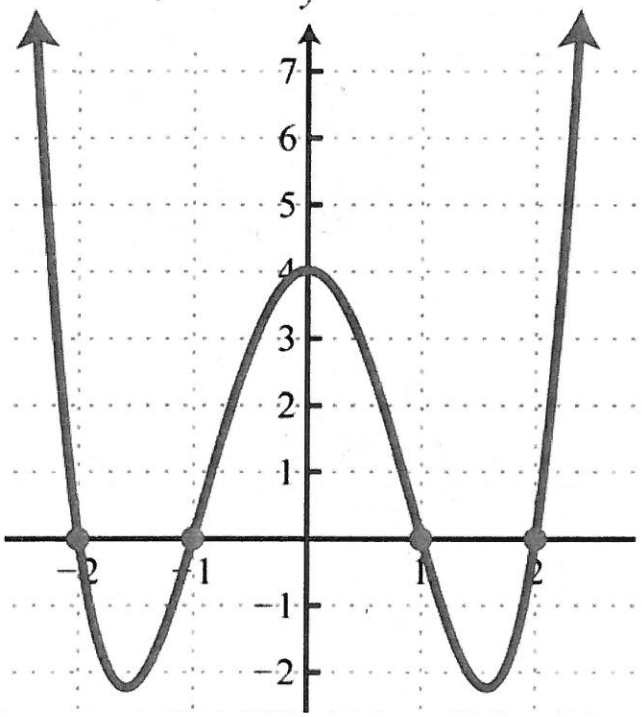
Analyze each graph.



1. f(1.57) = 1
f(0) = 0
x if f(x) = -1 $x = -1.57$
Domain $x \in \mathbb{R}$
Range $y \in [-1, 1]$
Zero(s) $-\pi, 0, \pi$
Is it a function? yes
Intervals of Increasing $(-1.57, 1.57)$
Intervals of Decreasing $[-\pi, -1.57) \cup (1.57, \pi)$
Relative Minimum(s) $(-1.57, -1)$
Relative Maximum(s) $(1.57, 1)$
Is it even or odd? odd
Is it one-to-one? No



1. f(-1) undefined
f(1) = 2
x if f(x) = 4 $x = 1$
Domain $x \in (-\infty, -1) \cup [1, \infty)$
Range $y \in (-\infty, 6)$
Zero(s) $x = -1.75, 5$
Is it a function? Yes
Intervals of Increasing $(-\infty, -1) \cup (1, 3)$
Intervals of Decreasing $(3, \infty)$
Relative Minimum(s) $(1, 2)$
Relative Maximum(s) $(3, 2)$
Is it even or odd? Nope
Is it one-to-one? Nope



1. f(0) = 4
f(-2) = 0
x if f(x) = 4 $x = -2.1, 0, 2.1$
Domain $x \in \mathbb{R}$
Range $[-2.1, \infty)$
Zero(s) $x = -2, -1, 1, 2$
Is it a function? Yes
Intervals of Increasing $(-1.5, 0) \cup (1.5, \infty)$
Intervals of Decreasing $(-\infty, -1.5) \cup (0, 1.5)$
Relative Minimum(s) $(-1.5, -2.1)$, $(1.5, -2.1)$
Relative Maximum(s) $(0, 4)$
Is it even or odd? Even
Is it one-to-one? No

4. Write the linear function given f(-3) = 4 and f(4) = -11.

$m = \frac{-11-4}{4--3} = \frac{-15}{7}$ $F(-3) = -\frac{15}{7}(-3) + b = 4$ → $\frac{45}{7} + b = \frac{28}{7}$ $b = -\frac{17}{7}$ $f(x) = -3x - \frac{17}{7}$

5. Write the linear function given f(4) = -5 and f(-1) = 2

$\frac{-5-2}{4--1} = \frac{-7}{5}$ $f(4) = \frac{-7}{5}(4) + b = -5$ → $\frac{-28}{5} + b = \frac{-25}{5}$ ⇒ $b = \frac{3}{5}$ $f(x) = \frac{-7}{5}x + \frac{3}{5}$

6. Find the x-intercepts of $f(x) = 3x^2 - 19x - 14$ without a graphing calculator.

$F(x) = 0 = 3x^2 - 19x - 14$

$3x^2 - 21x + 2x - 14$ (−42, −21, 2)

$3x(x-7) + 2(x-7)$

$(3x+2)(x-7) = 0$

(7, 0) $(-\frac{2}{3}, 0)$

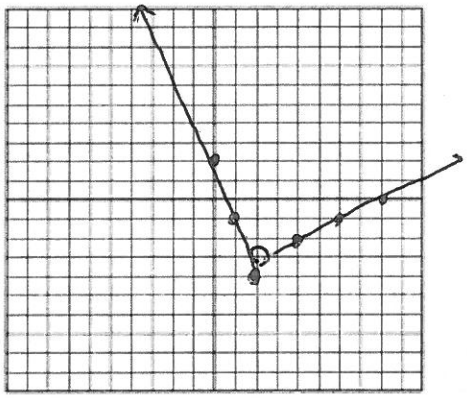
7. Find the zeros of $f(x) = \frac{2x-3}{2-x}$ without a graphing calculator.

$2x - 3 = 0$

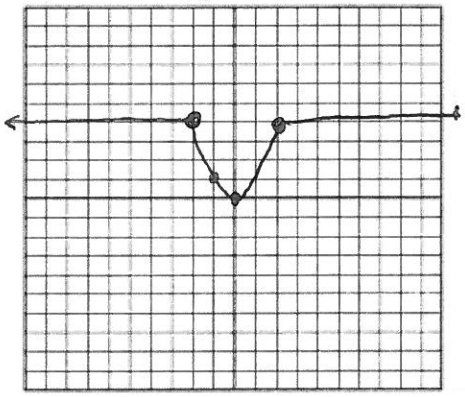
$x = 3/2$ $(3/2, 0)$

8.

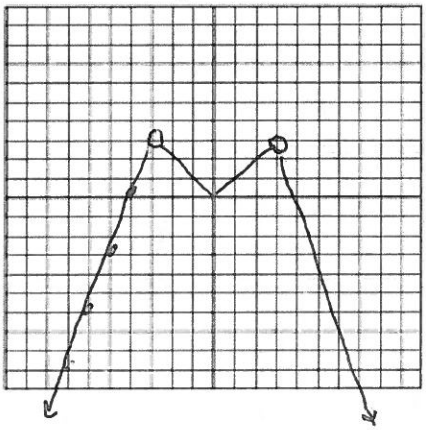
9. $h(x) = \begin{cases} -3x+2, & x \le 2 \\ \frac{1}{2}x - 4, & x > 2 \end{cases}$



10. $f(x) = \begin{cases} 4, & x \le -2 \\ x^2, & -2 < x < 2 \\ 4, & x \ge 2 \end{cases}$



11. $g(x) = \begin{cases} 3x+12, & x \le -3 \\ |x|, & -3 < x < 3 \\ -3x+12, & x \ge 3 \end{cases}$



12. $h(x) = \begin{cases} x^2 - 4, & x < 3 \\ \frac{2}{3}x - 5, & x \ge 3 \end{cases}$