

MPS21 – Precalculus
Exam 2 Review Sheet

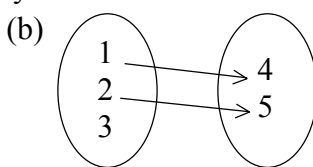
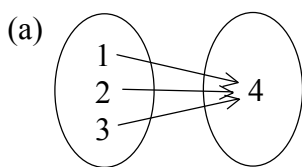
Topics:

- definition of a function and evaluating functions
- finding the domain of a function
- finding intervals where a function is positive/negative
- applications involving cost, revenue, and profit
- graphing linear and quadratic functions
- graphing piecewise functions
- finding intervals where a function is increasing/decreasing/constant
- the greatest integer function (floor) and least integer function (ceiling)
- odd and even functions

Practice Problems:

1. Find the domain and the range of the function $f(x) = \sqrt{16 - x^2}$.

2. Determine whether each relation represents a function. If not, why not? If it is a function, state whether it is one-to-one or many-to-one.



(c) $y = x^2$ (d) $x = y^2$

(e) $y = -5$ (f) $x = 3$

(g)

Input	-1	0	1	0	2
Output	4	5	6	2	7

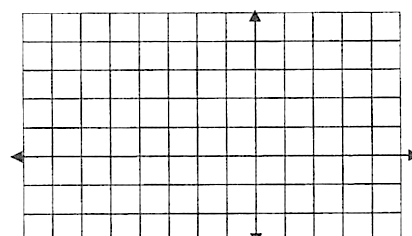
3. Solve the inequality by finding the critical points and making a sign chart:
 $x^3 + 6x^2 + 8x < 0$

4. State the domain of each function:

(a) $f(x) = 3x - 1$ (b) $f(x) = \frac{3x - 1}{x + 2}$ (c) $f(x) = \sqrt{25 - x^2}$

(d) $f(x) = \frac{\sqrt{4 - x}}{3}$ (e) $f(x) = \frac{x + 5}{\sqrt{3 - x}}$

5. Sketch the graph of $f(x) = \begin{cases} 5, & x \leq 4 \\ -x + 1, & -4 < x \leq 2 \\ x^2 - 3x, & x > 2 \end{cases}$



Determine the open intervals over which $f(x)$ is

- (a) increasing: _____
 (b) decreasing: _____
 (c) constant: _____

6. Given $f(x) = x^3 - 4x^2 - 7x + 10$, use synthetic division to determine if -2 is a root. Find all roots of the function.

7. A company produces a product for which the variable cost is \$5.35 per unit and fixed costs are \$16,000. The company sells the product for \$8.20 and sells all that it produces.

(a) Find the total cost C as a function of x , the number of units produced.

(b) Find the profit P as a function of x .

(c) If the company sells 5,000 units of the product, do they make a profit. Explain.

8. Determine whether each function is even, odd, or neither.

(a) $y = |x|$

(b) $y = x^4 + 3x^2 + 5x$

(c) $y = x$

(d) $y = 8$

9. Given $f(x) = \begin{cases} -x - 3, & x \leq -1 \\ x^2 - 2, & x > -1 \end{cases}$

(a) $f(-2)$

(b) $f(-1)$

(c) $f(0)$

(d) $f(2)$

10. Evaluate if $x = -4.2$.

(a) $\lfloor 3 + x \rfloor - 4$

(b) $\lfloor -x \rfloor + 1$

(c) $\lfloor x - 2 \rfloor + 1$

(d) $\lfloor 4 - x \rfloor$

(e) $\lfloor -0.1 \rfloor - \lfloor x + 5 \rfloor$

11. Graph $f(x) = \lfloor x \rfloor$ on the domain $-4 \leq x \leq 4$.

