

Unit 1, 2, 3, and 4 Exam Review: Equations, Functions, & Linear Functions

- Interpret Expressions and Rewrite Expressions with Rational Exponents

Examples:
1) Define a variable and write an expression:
-3 times the quantity of 8 plus a number times 6

$$-3(8 + 6n)$$

- Solve Linear Equations in One Variable

Example:

1) Solve. $3(3x - 5) = 5x - 12 + x$

$$\begin{aligned} 9x - 15 &= 6x - 12 \\ -6x &\quad -6x \\ \hline 3x - 15 &= -12 \\ +15 &\quad +15 \\ \hline 3x &= 3 \end{aligned}$$

$$\frac{3x}{3} = \frac{3}{3}$$

$$x = 1$$

y-int \rightarrow 0 -1 5 -2

Input	Output
1	1
2	3
3	5
4	7

$y = 2x - 1$

2+2
2+2
2+2

*** Remember: If you get a true statement ($2=2$ or $0=0$) \rightarrow Infinitely Many Solutions, if you get a false statement ($1=2$ or $0=4$) \rightarrow No solution

- Solve Linear Inequalities in One Variable

Example:

1) Solve and graph solution on number line.

$$3y - 6 < -7y + 14$$

$$\begin{aligned} +7y &\quad +7y \\ \hline 10y - 6 &< 14 \\ +6 &\quad +6 \\ \hline 10y &< 20 \\ \div 10 &\quad \div 10 \\ \hline y &< 2 \end{aligned}$$

Remember to flip the inequality if you multiply or divide by a negative number

- Using equations and inequalities to solve word problems.

Example:

1) An amusement park charges \$8 for admission and \$3 per ride. If your mom gave you \$40 to go, how many rides could you ride?

$$40 = 8 + 3x$$

$$\begin{aligned} -8 &\quad -8 \\ \hline 32 &= 3x \\ \div 3 &\quad \div 3 \\ \hline 10.67 &= x \end{aligned}$$

can only ride 10

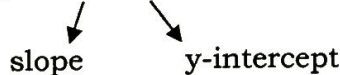
- Formal Recursive (Now-Next) and Explicit Forms of Functions

Example: Write the Now-Next rule and the Explicit rule for the table:

- Determine if a relation is a function

**A relation is a function if every input is directed to exactly one output. A graph must pass the "vertical line test" for it to be considered a function.

- Slope-Intercept form: $y = mx + b$



Slope (m): $\frac{y_2 - y_1}{x_2 - x_1}$

x-Intercepts (x, 0): Substitute 0 for y, solve for x.

y-Intercepts (0, y): Substitute 0 for x, solve for y.

THUMB

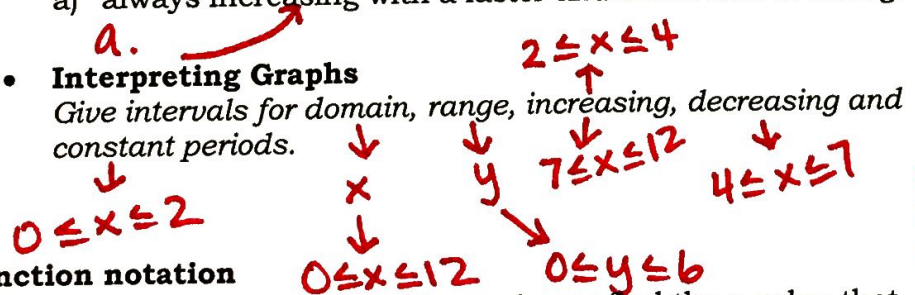
- Graphs of Real-World Situations

Example: Sketch a graph of a continuous function to fit each description.

a) always increasing with a faster and faster rate of change b) decreasing at a constant rate

- Interpreting Graphs

Give intervals for domain, range, increasing, decreasing and constant periods.



Function notation

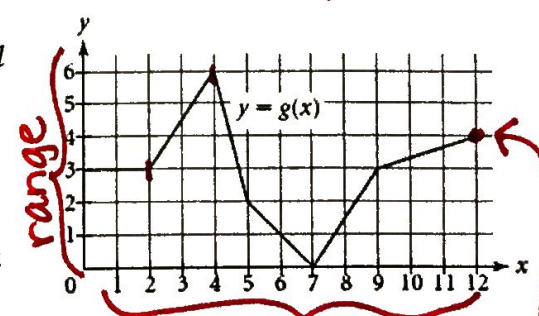
Evaluate a function for a specific x-value or find the x-value that produces a certain function value given an equation or graph.

Example: Given $f(x) = 3x + 8$, find $f(2)$ or find x so that $f(x) = -7$

$$f(2) = 3(2) + 8 = 6 + 8 = 14$$

Use the graph above to find $g(12)$ or find x so that $g(x) = 6$

if $g(x) = 6$
 $x = 4$



domain

$$g(12) = 4$$