Standard #: MAFS.912.F-IF.2.5

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Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble engines in a factory, then the positive integers would be an appropriate domain for the function.* ★

Subject Area: Mathematics

Grade: 912

Domain-Subdomain: Functions: Interpreting Functions

Cluster: Level 2: Basic Application of Skills & Concepts

Cluster: Interpret functions that arise in applications in terms of the context. (Algebra 1 - Major Cluster) (Algebra 2 - Major Cluster) -
Clusters should not be sorted from Major to Supporting and then taught in that order. To do so would strip the coherence of the mathematical ideas and miss the opportunity to enhance the major work of the grade with the supporting clusters.

Date Adopted or Revised: 02/14

Content Complexity Rating: Level 2: Basic Application of Skills & Concepts - More Information

Date of Last Rating: 02/14

Status: State Board Approved

Assessed: Yes

TEST ITEM SPECIFICATIONS

Item Type(s): This benchmark may be assessed using: MC item(s)

Assessed with:

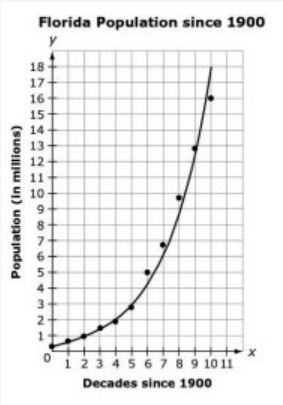
MAFS.912.F-IF.1.2

SAMPLE TEST ITEMS (1)

Test Item #: Sample Item 1

Question:

The points on the graph show the population data, in millions, of the state of Florida for each decade from 1900 to 2000. The data are modeled by the function $P(x) = 506975(1.43)^x$, shown on the graph.



What is the domain of the graph of P(x) that is shown?

Difficulty: N/A

Type: MC: Multiple Choice

Related Courses

Course Number	Course Title

1200310:	Algebra 1 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1200320:	Algebra 1 Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1200330:	Algebra 2 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1200340:	Algebra 2 Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1200370:	Algebra 1-A (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1200380:	Algebra 1-B (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1200400:	Intensive Mathematics (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1206330:	Analytic Geometry (Specifically in versions: 2014 - 2015 (course terminated))
1200500:	Advanced Algebra with Financial Applications (Specifically in versions: 2014 - 2015 (course terminated))
1200410:	Mathematics for College Success (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1200700:	Mathematics for College Readiness (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
7912070:	Access Liberal Arts Mathematics (Specifically in versions: 2014 - 2015, 2015 - 2018, 2018 - 2019, 2019 and beyond (current))
7912080:	Access Algebra 1A (Specifically in versions: 2014 - 2015, 2015 - 2018, 2018 - 2019, 2019 and beyond (current))
7912090:	Access Algebra 1B (Specifically in versions: 2014 - 2015, 2015 - 2018, 2018 - 2019, 2019 and beyond (current))
1200315:	Algebra 1 for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1200335:	Algebra 2 for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 - 2019 (course terminated))
1200375:	Algebra 1-A for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1200385:	Algebra 1-B for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1207300:	Liberal Arts Mathematics 1 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
7912075:	Access Algebra 1 (Specifically in versions: 2014 - 2015, 2015 - 2018, 2018 - 2019, 2019 and beyond (current))

Related Access Points

Access Point

Access Points Number	Access Points Title
MAFS.912.F-IF.2.AP.5a:	Given the graph of a function, determine the domain.

Related Resources

Formative Assessment

Name	Description
Airport Parking:	Students are given a graph and a verbal description of a function and are asked to describe its domain.
Car Wash:	Students are asked to describe the domain of a function given its graph.
Describe the Domain:	Students are given verbal descriptions of two functions and are asked to describe an appropriate domain for each.
Height vs. Shoe Size:	Students are asked to identify and describe the domains of two functions given their graphs.

Problem-Solving Task

Name	Description
Average Cost:	This task asks students to find the average, write an equation, find the domain, and create a graph of the cost of producing DVDs.
Oakland Coliseum:	This deceptively simple task asks students to find the domain and range of a function from a given context. The function is linear and if simply looked at from a formulaic point of view, students might find the formula for the line and say that the domain and range are all real numbers.
The Canoe Trip, Variation 1:	The purpose of this task is to give students practice constructing functions that represent a quantity of interest in a context, and then interpreting features of the function in the light of the context. It can be used as either an assessment or a teaching task.
The Canoe Trip, Variation 2:	The primary purpose of this task is to lead students to a numerical and graphical understanding of the behavior of a rational function near a vertical asymptote, in terms of the expression defining the function.

Text Resource

Name	Description
By the Skin of Their Suits:	This informational text resource is intended to support reading in the content area. The text discusses the two main factors that control the speed of a competitive swimmer: power and drag. The reader is then presented with mathematical formulas that determine these factors. The text also discusses the technological advances that have come about in the swimsuit industry. The text even entertains the idea of "technological doping" and allows the reader to question whether advanced swimsuits are hurting the competitiveness of swimming.

Lesson Plan

Name	Description
Compacting Cardboard:	Students with investigate the amount of space that could be saved by flattening cardboard boxes. The analysis includes linear graphs and regression analysis along with discussions of slope and a direct variation phenomenon.

Cup-Activity: writing equations from data:	This is a great lab activity that allows students to develop a true understanding of slope as a rate of change. Students are active and involved and must use higher order thinking skills in order to answer questions. Students work through an activity, measuring heights of cups that are stacked. Students them determine a "rate of change - slope". Students are then asked to put this into slope-intercept form. The important part here is in their determining the y-intercept of the equation. Students then take this further and finally attempt to create a linear inequality to determine how many cups, stacked vertically, will fit under a table.
Domain Representations:	This lesson asks students to use graphs, tables, number lines, verbal descriptions, and symbols to represent the domain of various functions. The material allows students to examine and utilize connections between a function's symbolic representation, a function's graphical representation, and a function's domain.
Exponential Graphing Using Technology:	This lesson is teacher/student directed for discovering and translating exponential functions using a graphing app. The lesson focuses on the translations from a parent graph and how changing the coefficient, base and exponent values relate to the transformation.
Functions and Everyday Situations:	This lesson unit is intended to help you assess how well students are able to articulate verbally the relationships between variables arising in everyday contexts, translate between everyday situations and sketch graphs of relationships between variables, interpret algebraic functions in terms of the contexts in which they arise and reflect on the domains of everyday functions and in particular whether they should be discrete or continuous.
Sine Curves and Biorhythms:	This is an activity in which students find their personal biorhythms using sine functions. Biorhythms are 3 cycles (physical, emotional, and intellectual) thought to affect our behavior and performance. The biorhythms have 3 different period lengths. Students need to compute the number of days they have lived to find where they are in these cycles. Students find the equations of the functions and then graph on a graphing calculator.

Virtual Manipulative

Name	Description
Function Flyer:	In this online tool, students input a function to create a graph where the constants, coefficients, and exponents can be adjusted by slider bars. This tool allows students to explore graphs of functions and how adjusting the numbers in the function affect the graph. Using tabs at the top of the page you can also access supplemental materials, including background information about the topics covered, a description of how to use the application, and exploration questions for use with the java applet.
Graphing Lines:	Allows students access to a Cartesian Coordinate System where linear equations can be graphed and details of the line and the slope can be observed.

Perspectives Video: Professional/Enthusiast

Name	Description
Hurricane Dennis & Failed Math Models:	What happens when math models go wrong in forecasting hurricanes?

Video/Audio/Animation

Name	Description
Relations and Functions:	This video demonstrates how to determine if a relation is a function and how to identify the domain.

Assessment

Name	Description
Sample 2 - High School Algebra 1 State Interim Assessment:	This is a State Interim Assessment for 9th-12th grades.
Sample 3 - High School Algebra 2 State Interim Assessment:	This is a State Interim Assessment for 9th-12th grades.
Sample 4 - High School Algebra 1 State Interim Assessment:	This is a State Interim Assessment for 9th-12th grades.
Sample 4 - High School Algebra 2 State Interim Assessment:	This is a State Interim Assessment for 9th-12th grade.

Unit/Lesson Sequence

Name	Description
	This sample Algebra 1 CMAP is a fully customizable resource and curriculum-planning tool that provides a framework for the Algebra 1 Course. The units and standards are customizable and the CMAP allows instructors to add lessons, worksheets, and other resources as needed. This CMAP also includes rows that automatically filter and display Math Formative Assessments System tasks, E-Learning Original Student Tutorials and Perspectives Videos that are aligned to the standards, available on CPALMS. Learn more about the sample Algebra 1 CMAP, its features and customizability by watching the following video:

Sample Algebra 1 Curriculum
Plan Using CMAP:

Using this CMAP

To view an introduction on the CMAP tool, please click here.

To view the CMAP, click on the "Open Resource Page" button above; be sure you are logged in to your iCPALMS account.

To use this CMAP, click on the "Clone" button once the CMAP opens in the "Open Resource Page." Once the CMAP is cloned, you will be able to see it as a class inside your iCPALMS My Planner (CMAPs) app.

To access your My Planner App and the cloned CMAP, click on the iCPALMS tab in the top menu.

All CMAP tutorials can be found within the iCPALMS Planner App or at the following URL: http://www.cpalms.org/support/tutorials_and_informational_videos.aspx

Student Resources

Name	Description
Average Cost:	This task asks students to find the average, write an equation, find the domain, and create a graph of the cost of producing DVDs.
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Graphing Lines:	Allows students access to a Cartesian Coordinate System where linear equations can be graphed and details of the line and the slope can be observed.
Oakland Coliseum:	This deceptively simple task asks students to find the domain and range of a function from a given context. The function is linear and if simply looked at from a formulaic point of view, students might find the formula for the line and say that the domain and range are all real numbers.
Relations and Functions:	This video demonstrates how to determine if a relation is a function and how to identify the domain.
The Canoe Trip, Variation 1:	The purpose of this task is to give students practice constructing functions that represent a quantity of interest in a context, and then interpreting features of the function in the light of the context. It can be used as either an assessment or a teaching task.
The Canoe Trip, Variation 2:	The primary purpose of this task is to lead students to a numerical and graphical understanding of the behavior of a rational function near a vertical asymptote, in terms of the expression defining the function.

Parent Resources

Name	Description
Average Cost:	This task asks students to find the average, write an equation, find the domain, and create a graph of the cost of producing DVDs.
Graphing Lines:	Allows students access to a Cartesian Coordinate System where linear equations can be graphed and details of the line and the slope can be observed.
Oakland Coliseum:	This deceptively simple task asks students to find the domain and range of a function from a given context. The function is linear and if simply looked at from a formulaic point of view, students might find the formula for the line and say that the domain and range are all real numbers.
The Canoe Trip, Variation 1:	The purpose of this task is to give students practice constructing functions that represent a quantity of interest in a context, and then interpreting features of the function in the light of the context. It can be used as either an assessment or a teaching task.
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