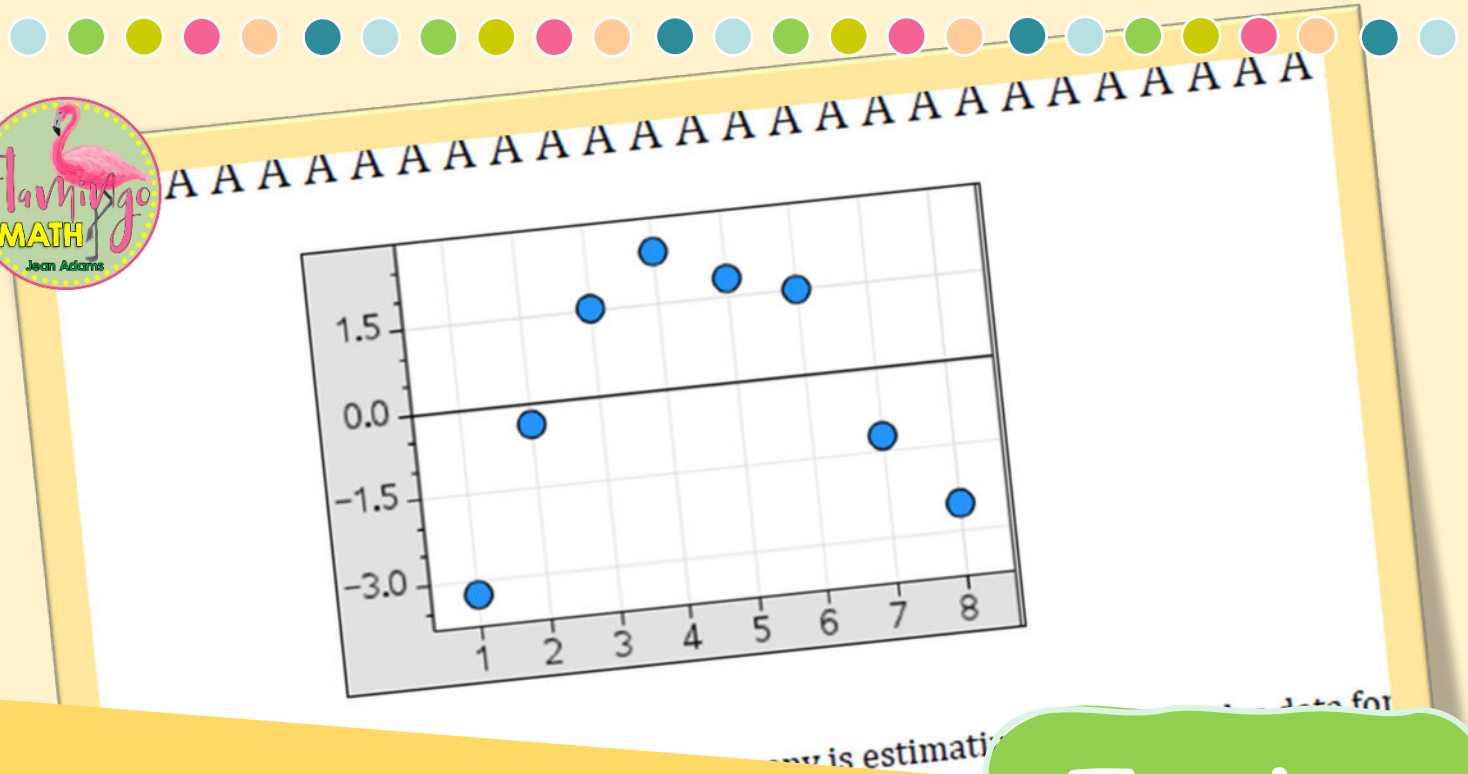
AP® Precalculus

Mock AP Exam

Editable Assessments



- ❑ AP-Style Practice Exam
- ❑ Year-End Review
- ❑ Full solution sets

Topics 1.1-3.15

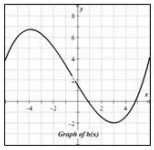
AP Precalculus Name _____

Final Exam Review

1) What are the intervals of increasing and decreasing of $f(x) = (x+4)^2$

2) Find the average rate of change over the interval $[-2, 4]$ given $g(x) = x^2 + 2$

3) The graph of $h(x)$ is shown in the figure at right for the interval $-6 \le x \le 6$. On what open interval(s) is h increasing?



Use the following function for problems 4 and 5. $f(x) = (x+5)(x-3)^2$

4) Identify the zeros and state their multiplicities.

5) Use limit notation to describe the end behavior of f.

Use the following function for problems 6 – 9. $g(x)$

6) Write an equivalent expression for $g(x)$ by factoring

7) Find the vertical and horizontal asymptotes of g.

8) Find the zeros of the function.

9) Find the coordinates of the hole of $g(x)$.

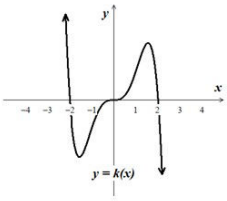
Use the rational function r is given by $r(x) = \frac{2x^2-5x+8}{x-3}$ for problems 16-18.

16) Determine the asymptotes of the function.

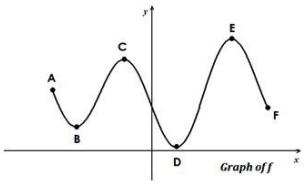
17) Use limit notation to describe the end behavior of r.

18) Use limit notation to describe the behavior of r as $x \to 3$ from both the left and right.

19) Write a polynomial function that could be used to represent the graph of $y = k(x)$ shown at right. Explain your reasoning.

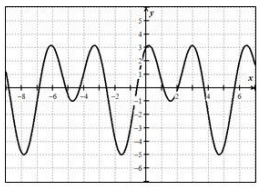


six points A, B, C, D, E, and F labeled for

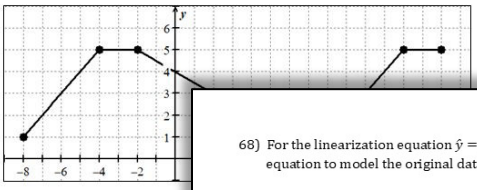


Unit 3

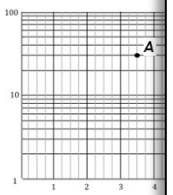
72) The periodic function f is graphed in the xy-plane. What is the best estimate of the period of f.



73) A portion of the graph of the periodic function g is shown below, where the period of g is 16. Find the value of $g(55)$



74) The point P lies at the intersection of the terminal r standard position measuring θ and the circle shown the sine, cosine and tangent from smallest to largest



65) The grid above is a semi-log plot with the vertical a estimate for each point plotted.

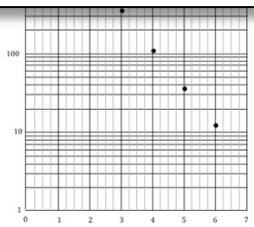
66) A set of data is shown on the semi-log plot at right. an exponential regression is used to model the data which of the following claim and explanation statements best fit these data?

A) The residual plot will show a clear pattern, because the exponential model was not appropriate.

B) The residual plot will show no clear pattern, because the exponential model was not appropriate.

C) The residual plot will show no clear pattern, because the exponential model was appropriate.

D) The residual plot will show a clear pattern, because the exponential model was appropriate.



67) If the logarithmic regression model is $\hat{y} = 3 + \ln(x-2)$, what is the residual for the point (5, 4)?

68) For the linearization equation $\hat{y} = 2.525x + 3.48$ where $\hat{y} = \ln y$, find the exponential equation to model the original data set.

For problems 69 – 70, find the solution set of the inequality.

69) $\log_2(x+3) < 4$

70) $\log_2(2x-3) \ge \log_2(x+2)$

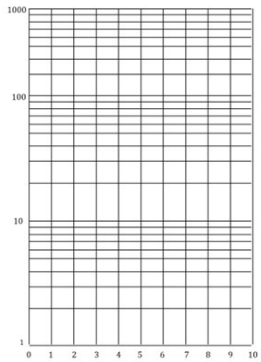
71) The table gives values for a function $k(t)$ at selected values of t.

t	1	2	3	4	5
$k(t)$	20	45	78	135	220

A) Graph the data on the semi-log plot.

B) What does the graph say about the data?

C) Approximate the values of $k(7)$ by finding an exponential regression equation.



Name _____ Date _____ Period _____

AP Precalculus **Mock Exam**

Multiple Choice (No Calculator)

1.	(A)	(B)	(C)	(D)	**15.**	(A)	(B)	(C)	(D)
2.	(A)	(B)	(C)	(D)	**16.**	(A)	(B)	(C)	(D)
3.	(A)	(B)	(C)	(D)	**17.**	(A)	(B)	(C)	(D)
4.	(A)	(B)	(C)	(D)	**18.**	(A)	(B)	(C)	(D)
5.	(A)	(B)	(C)	(D)	**19.**	(A)	(B)	(C)	(D)
6.	(A)	(B)	(C)	(D)	**20.**	(A)	(B)	(C)	(D)
7.	(A)	(B)	(C)	(D)	**21.**	(A)	(B)	(C)	(D)
8.	(A)	(B)	(C)	(D)	**22.**	(A)	(B)	(C)	(D)
9.	(A)	(B)	(C)	(D)	**23.**	(A)	(B)	(C)	(D)
10.	(A)	(B)	(C)	(D)	**24.**	(A)	(B)	(C)	(D)
11.	(A)	(B)	(C)	(D)	**25.**	(A)	(B)	(C)	(D)
12.	(A)	(B)	(C)	(D)	**26.**	(A)	(B)	(C)	(D)
13.	(A)	(B)	(C)	(D)	**27.**	(A)	(B)	(C)	(D)
14.	(A)	(B)	(C)	(D)	**28.**	(A)	(B)	(C)	(D)

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6. Which of the following functions has a graph in the xy −plane with a zero at $x = 4$, a vertical asymptote at $x = -1$,and a hole at $x = 3$.

(A) $g(x) = \dfrac{x^2 + 2x - 3}{x^2 - 7x + 12}$

(B) $h(x) = \dfrac{x^2 - 7x + 12}{x^2 - 2x - 3}$

(C) $j(x) = \dfrac{x - 4}{x^2 - 2x - 3}$

(D) $k(x) = \dfrac{x - 4}{x^2 - 7x + 12}$

x	−9	−6	−3	−2	0	3	4	6
$f(x)$	52	31	8	4	−7	5	9	18

7. The table above gives values for a polynomial function f at selected values of x. Let $g(x) = Af(Bx) + C$, where A, B, and C are positive constants. In the xy −plane, the graph of g is constructed by applying three transformations to the graph of f in this order: a horizontal dilation by a factor of 3, a vertical dilation by a factor of 2, and vertical translation by 7 units. What is the value of $g(-6)$?

(A) 246 **(B)** 29

(C) 193 **(D)** 15

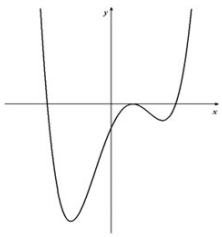
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x	−2	0	1	3	6
$f(x)$	5	−5	3	6	4
$g(x)$	−6	−3	0	−2	1

10. The table above gives values for the functions f and g at selected values of x. Functions f and g are defined for all real numbers. Let h be the function defined by $h(x) = f(g(x))$. What is the value for $h(3)$?

(A) 5 **(B)** 4

(C) 1 **(D)** −6



11. The figure shown is the graph of a polynomial function g. Which of the following could be an expression for $g(x)$?

(A) $0.15(x+3)^2(x+5)(x-6)$

(B) $0.15(x-3)^2(x-5)(x+6)$

(C) $0.15(x+3)(x+5)(x-6)$

(D) $0.15(x-3)(x-5)(x+6)$

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24. A complex number is represented by a point in the complex plane. The complex number has the rectangular coordinates $(-5, 5)$. Which of the following is an equivalent expression of the complex number using its polar coordinates (r, θ) ?

(A) $\left(5\cos\left(\frac{3\pi}{4}\right)\right) + i\left(5\sin\left(\frac{3\pi}{4}\right)\right)$

(B) $\left(5\sqrt{2}\cos\left(\frac{3\pi}{4}\right)\right) + i\left(5\sqrt{2}\sin\left(\frac{3\pi}{4}\right)\right)$

(C) $\left(5\cos\left(\frac{5\pi}{4}\right)\right) + i\left(5\sin\left(\frac{5\pi}{4}\right)\right)$

(D) $\left(5\sqrt{2}\cos\left(-\frac{\pi}{4}\right)\right) + i\left(5\sqrt{2}\sin\left(-\frac{\pi}{4}\right)\right)$

x	$f(x)$
5	1
15	2
45	3
135	4
405	5

25. The table shows values for a function f at selected values of x. Which of the following claim and explanation statements best fit these data?

(A) f is best modeled by an exponential function, because the outputs over consecutive equal-length input-value intervals are proportional.

(B) f is best modeled by an exponential function, because the inputs over consecutive equal-length output-value intervals are proportional.

(C) f is best modeled by a logarithmic function, because the inputs over consecutive equal-length output-value intervals are proportional.

(D) f is best modeled by a logarithmic function, because the outputs over consecutive equal-length input-value intervals are proportional.

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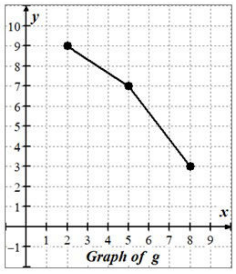
79. The height of the tide, in feet, on an intercoastal waterway, is modeled by the function h, defined by $h(t) = 4.3\cos\left(\frac{\pi}{6}t\right) + 7.8$ for $0 \le t \le 12$ hours. Based on the model, which of the following is true?

(A) The minimum height of the tide is 3.5 feet.

(B) The minimum height of the tide occurs at $t = 12$ hours.

(C) The maximum height of the tide is 12.4 feet

(D) The maximum height of the tide occurs at $t = 6$ hours.



80. The graph of g is shown above. Which of the following intervals gives the domain of g^{-1}, the inverse of g ?

(A) $[2, 8]$ **(B)** $[3, 9]$

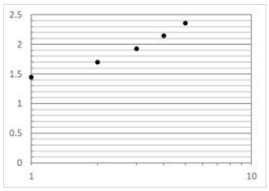
(C) $[-8, -2]$ **(D)** $\left[\frac{1}{9}, \frac{1}{3}\right]$

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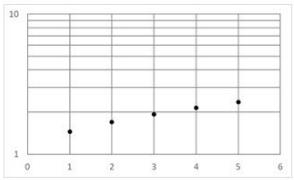
x	1	2	3	4	5
$k(t)$	28	50	85	140	230

85. The table above gives selected values for the function k at selected values of t. Which of the following graphs could represent these data in a semi-log plot, where the vertical axis is logarithmically scaled?

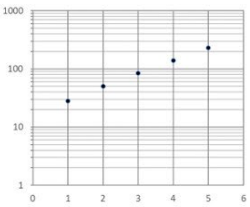
A.



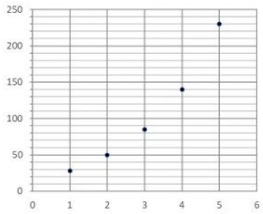
B.



C.



D.



Free Response Question-1
Calculator Required

x	1	2	3	4	5
$f(x)$	-6	-3	4	15	30

1. Let f be an increasing function defined for $x \ge 0$. The table gives values of $f(x)$ at selected values of x. The function g is given by $g(x) = \frac{x^2+11x+23}{x-2}$.

A. (i.) The function h is defined by $h(x) = (g \circ f)(x) = g(f(x))$. Find the value of $h(5)$ as a decimal approximation, or indicate that it is not defined. Show the work that leads to your answer.

(ii.) Find the value of $f^{-1}(4)$, or indicate that it is not defined.

B. (i.) Find all values of x, as decimal approximations, for which $g(x) = 4$.

(ii.) Determine the end behavior of g as x decreases without bound. Express your answer using the mathematical notation of a limit.

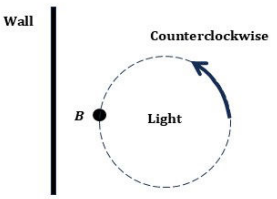
C. (i.) Based on the table, which of the following function types best models function f: linear, quadratic, exponential, or logarithmic?

(ii.) Give a reason for your answer in part C (i) based on the relationship between the change in the output values of f and the change in the input values of f. Refer to the values in the table in your reasoning.

Free Response Question-3
Calculator NOT Allowed



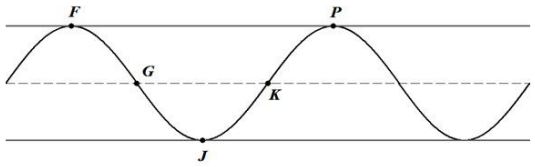
3. An emergency vehicle is parked next to your bedroom wall with the light on top of the vehicle is traveling in a circular path that completes 1 rotation every 18 seconds. When the light is closest to the wall, it is 8 feet from the wall. And, at $t = 0$ seconds, point **B** is closest to the bedroom wall as shown in the diagram. The light rotates around the base on the top of the vehicle at a constant speed, the distance from B to your bedroom wall periodically increases and decreases.



Note: Figure not drawn to scale

The sinusoidal function h models the distance between B and your wall, in feet, as a function of time t, in seconds.

A. The graph of h and its dashed midline for two full cycles is shown. Five points, F, G, J, K, and P are labeled on the graph. No scale is indicated, and no axes are presented. Determine possible coordinates $(t, h(t))$ for the five points F, G, J, K, and P.



B. The function h can be written in the form $h(t) = a\cos[b(t + c)] + d$. Find values of the constants a, b, c, and d.