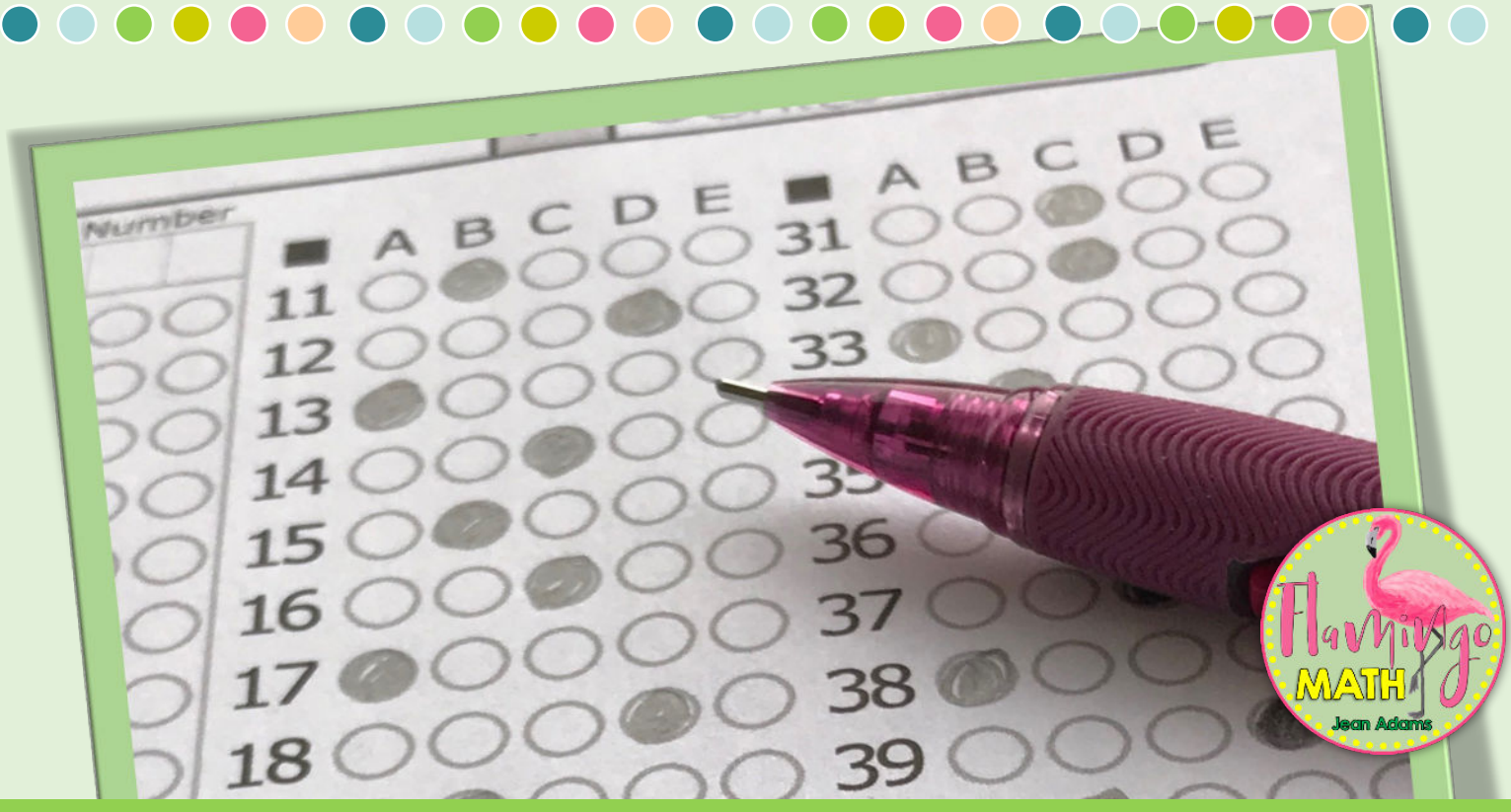
Precalculus Honors

Semester Exam and Review



Editable Assessments

Precalculus Honors Semester Review & Exam

This resource is designed for a Precalculus Honors course.

Product Overview

MID-YEAR REVIEW & SEMESTER EXAM

Here is a comprehensive review packet of 65 questions for your PreCalculus Honors students to prepare for their Mid-Term Exam. The content covers units 1-4 in my full year curriculum. The answers are included at the end of the packet so students will know they are on the right path.

The content covers units 1-10 in my full year curriculum and include two different versions of a multiple-choice exam:

- Form A is 40 questions and excludes the matrix chapter.
- Form B is 45 questions and includes the matrix chapter.

There is also a MICROSOFT WORD® version that is fully-editable if you need to adjust the questions to meet your district and personal needs.

You will also find a 50-question ZIP GRADE PDF document if you need one.

There are 32 pages of rigorous material to prepare your students and test them at a level that lets you know their true abilities for the entire course.

Teacher Notes – Using the Resource

All review assignments, quiz, and test items are both in PDF format and Microsoft Word for creating and altering items to meet your teaching needs, *minimize your prep time, and offer a variety of assessment instruments.*.



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Date _____ Pe

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Pre-Calculus Semester Examination – Form A
Part 2: Calculator Permitted

31. Find the range of the function: $f(x) = \sqrt{x^2 - 4}$

A) $(-\infty, \infty)$ **B)** $[-2, 2]$
C) $(-\infty, -2], [2, \infty)$ **D)** $[0, \infty)$
E) None of these

32. Find the inverse of the function: $f(x) = \frac{x+3}{2}$

A) $f^{-1}(x) = 2x - \frac{2}{3}$ **B)** $f^{-1}(x) = 2x - 6$
C) $f^{-1}(x) = \frac{2}{x+3}$ **D)** $f^{-1}(x) = 2x - 3$
E) None of these

33. Use a graphing utility to determine all local maxima and/or minima for the function $y = 2x^3 - 7x^2 - 4x$. Give the values where the extremum occur to three decimal places.

…at $x = -22.570$
…m at $x = 2.591$

…2% for 12 years. If the interest is compounded continuously, …n 12 years?

B) $13,375.68
D) $89,973.40

35. Use a graphing utility to graph: $y = 2x^3 + 3x^2 - 12x$, and determine the open intervals over which the function is increasing or decreasing.

A) Increasing on $(-\infty, -2)$
B) Increasing on $(-\infty, 20), (-7, \infty)$ Decreasing on $(20, -7)$
C) Increasing on $(-\infty, -2), (1, \infty)$ Decreasing on $(-2, 1)$
D) Increasing on $(-\infty, 20)$ Decreasing on $(-7, \infty)$
E) None of these

36. Evaluate $\log_4 7$ Round your answer to four decimal places.

A) 0.5596 **B)** 0.2430
C) 1.4037 **D)** 0.7124
E) None of these

37. A photograph is 4 inches longer than it is wide. If th… is 252 $in.^2$. Find the dimensions of the photograph …

A) 10 $in.$× 14 $in.$ **B)**
C) 10 $in.$× 12 $in.$ **D)**
E) None of these

38. The population of the world was 5.7 billion in 1995 … growth model where the growth rate is assumed to … $P(t) = P_0(1 + r)^t$

A) 2012 **B)**
C) 2029 **D)**
E) None of these

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39. Which is the correct value of $\sin^{-1}(0.6)$ … hundredth.

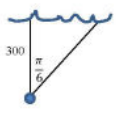
A) 1.77
C) 95.49
E) 0.03

40. The table shows average salaries for em… Mediocre Tools, Inc. Find a linear regre… for the data and estimate the average sa… (Use $x = 0$ for 1975).

A) $18,610
C) $23,266 **D)** $23,791
E) None of these

41. A lighthouse is on an island 300 feet from shore as shown. When the angle $\theta = \frac{\pi}{6}$, what is the distance between the lighthouse and the point where the light beam hits the shore?

A) 346.41 ft **B)** 259.81 ft
C) 600 ft **D)** 450 ft
E) None of these



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Use this information to answer Questions 42-44.
In a certain state park, the number of elk present after t years is modeled by $P(t) = \frac{1216}{1 - 75e^{-0.05t}}$

42. What was the initial population of elk?

A) 16 **B)** 75
C) 76 **D)** 1216
E) None of these

43. In how many years will the number of elk be 750?

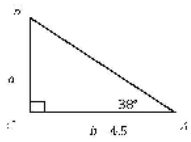
A) 135 **B)** 160
C) 105 **D)** 210
E) None of these

44. What is the maximum number of elk possible in the park?

A) 16 **B)** 75
C) 76 **D)** 1216
E) None of these

45. Find the value of side a.

A) 2.770
B) 3.516
C) 5.760
D) 7.309
E) None of these



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Pre-Calculus Semester Examination – Form A
Part 2: Calculator Permitted

31. Find the range of the function: $f(x) = \sqrt{x^2 - 4}$

A) $(-\infty, \infty)$ **B)** $[-2, 2]$
C) $(-\infty, -7] \cup [2, \infty)$ **D)** $[0, \infty)$
E) None of these

32. Find the inverse of the function: $f(x) = \frac{x+3}{2}$

A) $f^{-1}(x) = 2x - \frac{3}{2}$ **B)** $f^{-1}(x) = 2x - 6$
C) $f^{-1}(x) = \frac{2}{x-3}$ **D)** $f^{-1}(x) = 2x - 3$
E) None of these

33. Use a graphing utility to determine all local maxim… $f(x) = x^2 - 4x$. Give the values where the extremum o…

A) Maximum only at $x = -0.257$
B) Maximum at $x = -0.532$; Minimum at $x = -22.5$…
C) Maximum at $x = -0.257$; Minimum at $x = 2.59$…
D) Minimum only at $x = 2.591$
E) None of these

34. Rachel invests $5000 at a rate of 8.2% for 12 year… what will the investment be worth in 12 years?

A) $32,004.30 **B)**
C) $5013.68 **D)**
E) None of these

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35. Use a graphing utility to graph: $y = 2x^3 + 3x^2 - 12x$, and determine the open intervals over which the function is increasing or decreasing.

A) Increasing on $(-\infty, -2)$
B) Increasing on $(-\infty, 20), (-7, \infty)$ Decreasing on $(20, -7)$
C) Increasing on $(-\infty, -2), (1, \infty)$ Decreasing on $(-2, 1)$
D) Increasing on $(-\infty, 20)$ Decreasing on $(-7, \infty)$
E) None of these

36. Evaluate $\log_4 7$ Round your answer to four decimal places.

A) 0.5596 **B)** 0.2430
C) 1.4037 **D)** 0.7124
E) None of these

…it is wide. If the frame is 2 inches wide, the combined area …e photograph without the frame.

B) $9\ in. \times 12\ in.$
D) $8\ in. \times 11\ in.$

…billion in 1995 and increases according to the exponential … is assumed to be 2%. When will the population double?

B) 2027
D) 2030

PRECALCULUS SEMESTER EXAM REVIEW

UNIT 1

1. 1. Solve:

a.) $2x^3 = -3x^2 + 2x$ b.) $x^2 = 3x - 1$

2. Find the domain and range of the function, give your answer in interval notation:

a.) $y = x^2 + \sqrt{x-3}$ b.) $y = \frac{x-5}{x^2-x-20}$

3. Determine the intervals over which the function is increasing, decreasing, or constant.

a.) $f(x) = (x^2 - 4)^2$ b.) $f(x) = |x - 1| + 1$

c.) $g(x) = \frac{x^2}{x^2-4}$ d.) $h(x) = \sqrt[3]{x+1}$

4. Determine whether the function is even, odd, or neither.

a.) $f(x) = x^5 + 3x - 4$ b.) $f(x) = x^4 - 10x^2$

c.) $g(x) = 2x\sqrt{x^2 + 2}$

5. Find all the vertical and horizontal asympto…

a.) $y = \frac{2x}{x^2+7x+10}$

c.) $y = \frac{3}{3-x}$

6. Find $(f \circ g)(x)$ and $(g \circ f)(x)$

a.) $f(x) = x^3 - 1$
$g(x) = \sqrt[3]{x+4}$

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39. Which is the correct value of $\sin^{-1}(0.6)$? Expres… hundredth.

A) 1.77 **B)**
C) 95.49 **D)**
E) 0.03

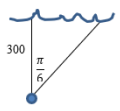
40. The table shows average salaries for employees … Mediocre Tools, Inc. Find a linear regression equ… for the data and estimate the average salary in 20… (Use $x = 0$ for 1975).

1995	20,491
2000	21,925

A) $18,610 **B)** $22,742
C) $23,266 **D)** $23,791
E) None of these

41. A lighthouse is on an island 300 feet from shore as shown. When the angle $\theta = \frac{\pi}{6}$, what is the distance between the lighthouse and the point where the light beam hits the shore?

A) 346.41 ft **B)** 259.81 ft
C) 600 ft **D)** 450 ft
E) None of these



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45. Solve for x:

a.) $24\left(\frac{1}{2}\right)^{\frac{x}{3}} = 12$ b.) $64\left(\frac{3}{8}\right)^{\frac{x}{4}} = 9$ c.) $3^{2x-1} = 27$

46. Graph $y = \log(x + 2) + 1$

47. Use properties of logarithms to expand the following, assume x and y are positive:

a.) $\ln\sqrt[5]{\frac{x}{10}}$ b.) $log\frac{100x}{x^2y}$ c.) $\log\frac{\sqrt{x+1}}{x^2}$

48. Use properties of logarithms to write each expression as a single logarithm, assume x and y are positive:

a.) $\ln x^2 - 3\ln xy$ b.) $2\log(5x) + 3\log(xy)$ c.) $\frac{1}{2}[\log(x-3) - \log 9]$

49. Marcy has $1600 to invest at 8% annual interest compounded monthly. How long will it take her investment to grow to $2400?

50. Find a logarithmic regression equation to fit the model in the table given:

x	1	2	3	4	5
y	2	4.5	5	6	7

UNIT 4

51. Convert 72° to radians.

a.) 72° b.) 80° c.) −640°

52. Convert to degrees.

a.) $\frac{4\pi}{15}$ b.) $\frac{\pi}{9}$ c.) $\frac{7\pi}{18}$

53. Find the length of an arc intercepted by a central angle of 72°in a circle whose radius is 16 inches.

54. Find the speed of a truck with wheels that are 36 inches in diameter if the wheels are rotating at 540 revolutions per minute.

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