VERSION 2.

Precalculus

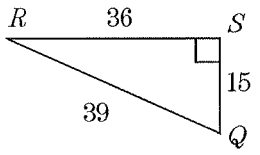
Name _____

Review for Final Exam (Test 3)

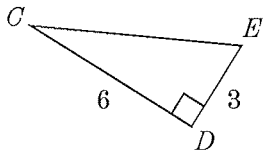
Per [illegible]: _____

Note: Make 1 page of notes and be sure to review quizzes. Look for more review on Website.
YOU NEED TO TURN IN ALL REVIEW WORK.

1. Find $\cos \angle Q$.

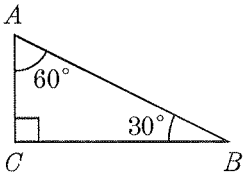


2. Find $\sin \angle E$.

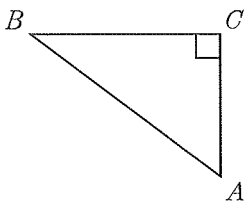


3. Find $\tan \angle E$.

4. If $BC = 3$, find AB.

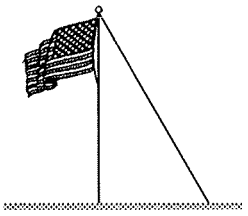


5. Solve the right triangle if $\angle A = 58°$ and $c = 11.8$ feet. Give lengths to 3 significant figures and angles to the nearest tenth of a degree.



6. Solve the right triangle shown in the previous problem if $b = 6$ kilometers and $c = 13$ kilometers. Give lengths to 3 significant figures and angles to the nearest tenth of a degree.

7. A wire 32 feet long is attached to the top of a flagpole 23 feet long. Approximately what is the measure of the angle the wire makes with the ground? Round your answer to the nearest tenth of a degree or nearest ten minutes.



8. Caroline is standing at the top of a 45 meter tall building. As she looks down at a nearby smaller building, she is able to measure the angle of depression of the base to be 42° while the angle of depression of the top is 31°. Find the height of the smaller building. What is the horizontal distance between the buildings?

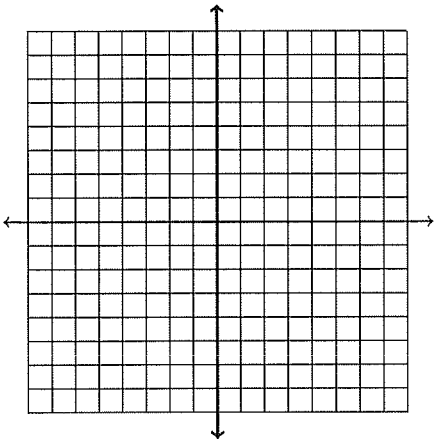
9. A pendulum 4.2 feet long swings from one end of a yard stick to the other end. Through what angle does the pendulum swing?

10. a) Sketch the following angles on the coordinate axes.
b) Name the quadrant.
c) Find the reference angle.

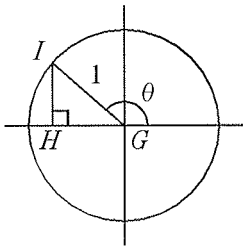
285°

238°

−615°.



Use the diagram and given information to find $\sin \angle HGI$.



11. $GH = -\dfrac{\sqrt{17}}{9}$

Find each value exactly (no decimals).

12. $\cos 30°$

13. $\sin 135°$

14. $\tan 240°$

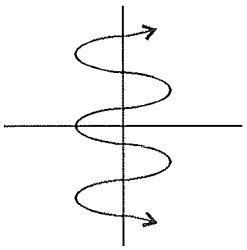
Use the given point on the terminal side of an angle θ in standard position. Then evaluate the 3 trigonometric functions, $\cos\theta$, $\sin\theta$ and $\tan\theta$.

15. $(-1, 1)$

16. $(2, -5)$

Which of the following represent a function?

17.



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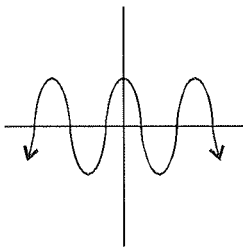
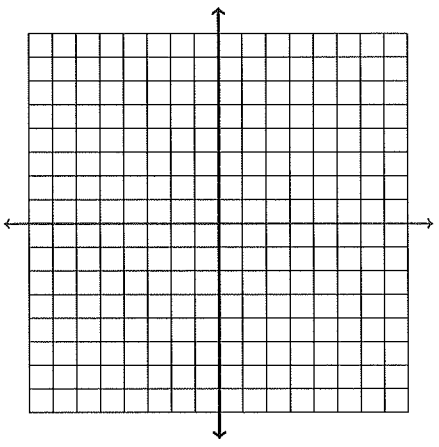


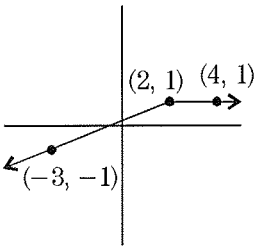
Graph.

19. $f(x) = \begin{cases} 3x + 2, & \text{if } x \geq 1 \\ 5x, & \text{if } x < 1 \end{cases}$



Write the equation of the graph.

20.



21. What is the domain of $f(x) = \dfrac{\sqrt{x^2-9}}{x-5}$?

A) $x \neq 3$ and $x \neq 5$
B) $|x| \geq 3$ and $x \neq 5$
C) $|x| \leq 9$ and $x \neq 5$
D) $x \neq 5$
E) $|x| \leq 3$ or $x \neq 5$

22. Find the domain of the function $f(x) = 3 + \ln(x-1)$.

A) $(0, \infty)$
B) $(3, \infty)$
C) $(-\infty, \infty)$
D) $(-\infty, 1)$
E) $(1, \infty)$

23. The range of $y = \dfrac{x}{x^2+1}$ is

A) $y < \frac{1}{2}$
B) $|y| = \frac{1}{2}$
C) $y > -\frac{1}{2}$
D) $y < \frac{1}{2}$ or $y > 1$
E) $|y| \leq \frac{1}{2}$

Find the slope.

24. $(-4, 2)$ $(4, 14)$

25. Find the slope of the line: $-x - 3y = -6$.

Write the equation of the line.

26. passes through $(1, 6)$ and $(-2, -9)$

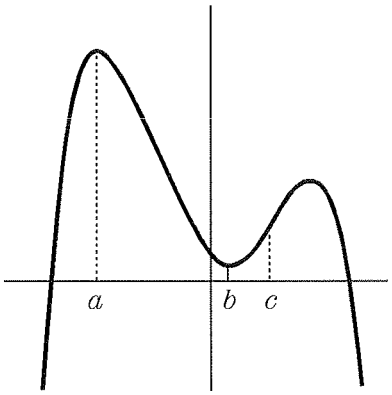
27. Write the equation of the line that contains $(4, -3)$ and is perpendicular to the line $y = -4x$.

Simplify.

28. $\left(-\dfrac{r}{2w}\right)^5$

29. $-7ay^3 \cdot 5a^{-1}y^{-2}$

30.



Write down the points for which the graph of the function is a, b, and/or c.

a) increasing

b) decreasing

c) concave up

d) concave down

31. What is the average rate of change over $2 \leq t \leq 4$?

t	2	3	4	5	6
$f(t)$	1.8	3.4	4.6	6.4	8.4

A) 0.714
B) −2.8
C) 2.8
D) −1.4
E) 1.4

32. The position of an object is given by $s = t^2 - 3t + 8$. What is its average velocity for $2 \le t \le 4$?

A) 3
B) -2
C) 0.333
D) 2
E) -3

33.

x	3.7	4.3	4.9	5.5	6.1
$f(x)$	1.8	3.4	4.6	6.4	8.4

A function f is given by the table shown.

Is f likely concave up or down near $x = 5.2$? Why? Explain your reasoning with numerical information from the table.

34. Which of the following is equal to $e^{\ln x + \ln 3}$?

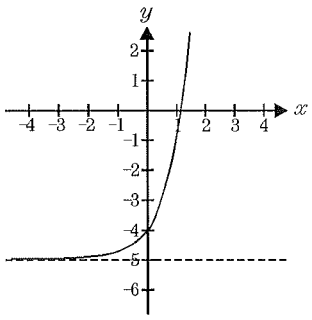
A) $3x$
B) x^{30}
C) 3^{10x}
D) e^{3x}
E) $\ln \frac{x}{3}$

35. Choose the expression equivalent to $\ln\left(\frac{9a^2}{2b}\right)$.

A) $\frac{\ln 9 + \ln a^2}{\ln 2 + \ln b}$
B) $\ln\left(\frac{9}{2}\right) + \ln\left(\frac{a}{b}\right)^2$
C) $\ln(9a^2) + \ln(2b)$
D) $\ln 9 - \ln 2 + 2\ln a - \ln b$
E) $2\ln(9a) - \ln(2b)$

36. Which of the following functions could have the graph sketched here?

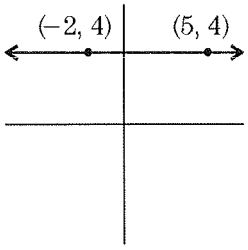
A) $f(x) = 4^{-x} + 5$
B) $f(x) = 4^{-x} - 5$
C) $f(x) = 4^{x} + 5$
D) $f(x) = 4^{x} - 5$
E) $f(x) = e^{4x} - 5$



37. Explain the statement: "The number of crimes per year is increasing at a decreasing rate."
Draw a graph of # of crimes (y) versus time (t).

Write the equation of the line.

38.



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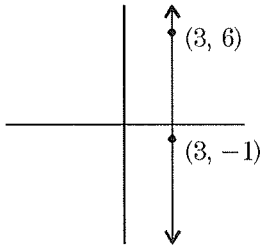


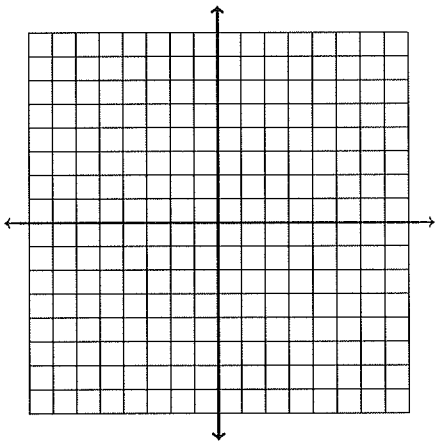
40. Use the formula $\log_b M = \frac{\log_a M}{\log_a b}$ to change $\log_{12} 3.81$ to a base 10 log. Then find the value of the log to the nearest ten-thousandth.

Solve.

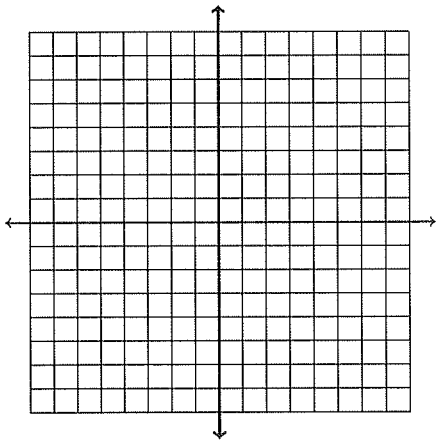
41. $3e^{2x-1} = 12$

Graph each function. Label x and y intercepts and asymptotes.

42. $y = 2^{x+2}$



43. $y = \log(x + 8)$



44. The number of compact discs purchased each year is increasing exponentially. The number N, in millions, purchased is given by the exponential function $N(t) = 7.5(3)^{0.5t}$, where t is the number of years after 1985.

    a) Find the number of compact discs sold in 1985, 1987, and 1994.

    b) Estimate the number of compact discs that will be sold in the year 2000.

45. You have decided to invest \$1000 at a 10% annual rate of interest. How much will you have accumulated after two years if the interest is compounded

    a) annually?

    b) quarterly?

    c) daily?

    d) continuously?

46. The CONTINUOUS growth rate of the demand for oil in the United States is 10% per year. When will the demand be double that of 1993?

47. If you start with one gram of a certain isotope, you have 0.9 gram after 7 days.

    a) Find a formula that gives how much is left after t days.

    b) How much is left after a year? (365 days)

    c) What is the half-life of this isotope?

    d) How long will it be until there is $\frac{1}{10}$ gram left?

48. The decibel scale used to measure sound is a logarithmic scale with the level of the sound equal to ten times the log of the ratio of the sound to the loudest sound detectable by the human ear. How many times more intense is rock music at 98 dB than a vacuum cleaner at 75 db?

49. REVIEW RADIANS, ARCLENGTH, PERIOD, AMPLITUDE AND MIDLINE. SEE QUIZ.