Name _____
Calculus
Summer Review Packet

Multiple Choice: *Choose the correct answer and write the corresponding letter in the blanks.*

_____ 1. Find the distance between the points $(-6, 10)$ and $(12, 2)$

a. $2\sqrt{7}$ b. $2\sqrt{97}$ c. 10 d. $2\sqrt{65}$

_____ 2. An open rectangular box with volume 5 m^3 has a square base. Express the surface area of the box as a function $S(x)$ of the length x of a side of the base.

a. $S(x) = x^2 + \frac{20}{x}$ b. $S(x) = x^2 + \frac{10}{x^2}$ c. $S(x) = 2x^2 + \frac{5}{x^2}$ d. $S(x) = 2x + \frac{5}{x}$

_____ 3. Find the midpoint of the segment joining $(-2, 1)$ and $(16, 3)$

a. $(7, 2)$ b. $(9, 1)$ c. $(14, 4)$ d. $(-9, -1)$

_____ 4. Solve the following inequality: $|2x - 3| < 7$

a. $(-\infty, -2), (5, \infty)$ b. $(-2, 5)$ c. $(-5, -2)$ d. $(-\infty, 5)$

_____ 5. The monthly cost of driving a car depends on the number of miles driven. Mary found that in December it cost her \$267.5 to drive 300 mi and in July it cost her \$317.5 to drive 700 mi. Express the monthly cost C as a function of the distance driven d assuming that a linear relationship gives a suitable model.

a. $C = 0.125d + 230$ b. $C = 230d + 0.125$ c. $C = 0.125d - 230$ d. $C = 230d - 0.125$

_____ 6. What is the radius of the following circle: $x^2 + y^2 - 6x + 2y - 6 = 0$

a. $\sqrt{6}$ b. 5 c. $\sqrt{10}$ d. 4

_____ 7. The distance between $(x, 4)$ and $(-1, 1)$ is 5. Which of the following is a correct value for x?

a. 5 b. 3 c. 2 d. 6

_____ 8. Under ideal conditions a certain bacteria population is known to double every three hours. Suppose that there are initially 25 bacteria. What is the size of the population after 15 hours?

a. 810 bacteria b. 1600 bacteria c. 3000 bacteria d. 800 bacteria

_____ 9. What is the x-intercept of the graph of $y = x^3 - 3x$

a. 3 b. $\sqrt{3}$ c. -1.50 d. -1.44

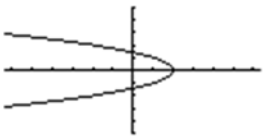
_____ 10. Which of the following is a point of intersection for the curves:
$y = x^2 - 4$ and $x - 2y = -7$

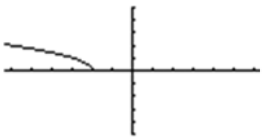
a. $(2,3)$ b. $(3,5)$ c. $(5,-2)$ d. $(0,-4)$

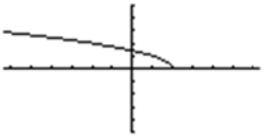
_____ 11. Which of the following is the center of the circle: $x^2 + y^2 + 4x - 6y - 12 = 0$

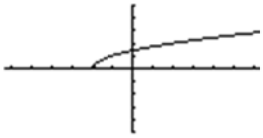
a. $(4,-6)$ b. $(2,3)$ c. $(-2,3)$ d. $(-4,6)$

_____ 12. Which of the following is the graph of $y = \sqrt{2-x}$

a. 

b. 

c. 

d. 

_____ 13. Find the domain of the function: $f(x) = \frac{\sqrt{x-2}}{-x^2}$

a. $x \geq 2$ b. $x \neq 0$ c. $x \leq -2$ d. $x \leq 2$

_____ 14. Find $\frac{f(x+h) - f(x)}{h}$ if $f(x) = 5x^2 + 4x$

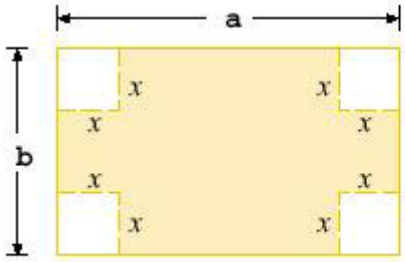
a. $10x + 5h + 4$ b. $5x + h + 4$ c. $10x - 4$ d. $5x + 5h + \frac{4}{h}$

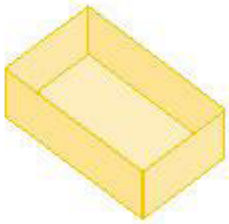
_____ 15. Given $f(x) = \begin{cases} x^2 & \text{for } x < -2 \\ |x| & \text{for } -2 \leq x \leq 5 \\ \sqrt{x-1} & \text{for } x > 5 \end{cases}$ Find $f(-2)$

a. 4 b. 2 c. $\sqrt{-3}$ d. -2

_____ 16. A box with an open top is to be constructed from a rectangular piece of card board with dimensions $b = 17$ in. by $a = 23$ in. by cutting out equal squares of side x at each corner and then folding up the sides as in the figure. Express the volume V of the box as a function of x.

a. $V(x) = x(23 - x)(17 - x)$
b. $V(x) = x(23 + x)(17 + x)$
c. $V(x) = x(23 - 2x)(17 - 2x)$
d. $V(x) = x(23)(17)$





_____ 17. If $f(x) = 3 - x^2$ and $g(x) = \frac{4}{\sqrt{2x + 1}}$ Find $f[g(x)]$

a. $\frac{4}{\sqrt{7 - 2x^2}}$ b. $\frac{6x - 13}{2x + 1}$ c. $\frac{12 - 4x^2}{\sqrt{2x + 1}}$ d. $\frac{4}{(3 - x^2)\sqrt{2x + 1}}$

_____ 18. If $f(x) = 1 - x^2$ and $g(x) = 2x + 1$ Find $(f - g)(-3)$

a. -3 b. -13 c. 18 d. -1

_____ 19. Which of the following is the range of the function: $f(x) = \frac{\sqrt{x + 2}}{3x}$

a. $x \neq 0$ b. $x \geq -2$ c. $x > -2$ d. $x \geq -2$ and $x \neq 0$

_____ 20. Given $f(x) = -x^2$ and $g(x) = 3 - x$ Find $(g \circ f)(-4)$

a. 19 b. -13 c. -1 d. -49

_____ 21. Express $75°$ as an angle in radian measure.

a. 75π b. $\frac{5\pi}{12}$ c. $\frac{5\pi}{24}$ d. $\frac{13500}{\pi}$

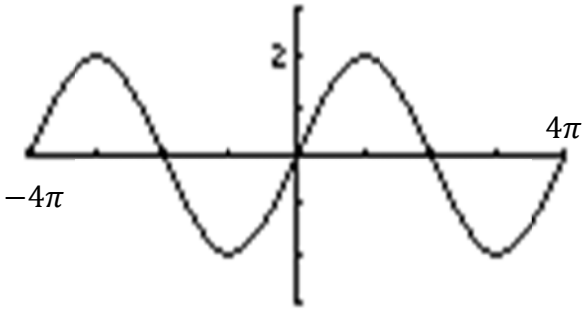
_____ 22. Express the angle $\frac{7\pi}{9}$ in degrees.

a. $20°$ b. $280°$ c. $140°$ d. $210°$

_____ 23. What is the amplitude of the function: $f(x) = -3\sin \pi x$

a. 3 b. -3 c. 2 d. 1

_____ 24. Which of the following is the equation to the right?



a. $y = 2\sin 2x$ b. $y = 2\sin x$

c. $y = \sin \pi x$ d. $y = 2\sin \frac{x}{2}$

_____ 25. Evaluate: $\sec(-210°)$

a. $-\frac{1}{2}$ b. $-\frac{2\sqrt{3}}{3}$ c. -2 d. -1

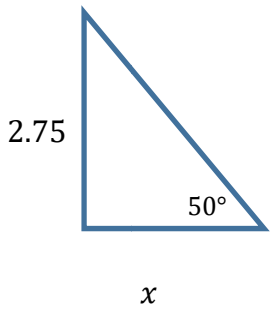
_____ 26. Evaluate: $\sin \frac{11\pi}{6}$

a. $\frac{1}{2}$ b. $\frac{\sqrt{3}}{2}$ c. $-\frac{\sqrt{3}}{2}$ d. $-\frac{1}{2}$

_____ 27. Find all solutions for the interval $[0,2\pi)$: $2\cos^2 x - \cos x = 1$

a. $0, \frac{\pi}{2}, \pi$ b. $0, \frac{2\pi}{3}, \frac{4\pi}{3}$ c. $0, \frac{\pi}{3}, \frac{5\pi}{3}$ d. $\frac{\pi}{3}, \frac{\pi}{2}$

_____ 28. Solve for x.



a. $x = 2.31$ b. $x = 3.28$

c. $x = 4.28$ d. $x = 3.59$

_____ 29. Two sides of a triangle have lengths of 5.7 ft and 7.5 ft. The angle formed by the two sides has a measure of 47°. How long is the third side of the triangle?

a. 6.3 ft b. 5.5 ft c. 8.8 ft d. 30.5 ft

_____ 30. Find the equation, in slope intercept form, of the line through the points (2, 6) and (4, -4).

a. $y = 5x - 4$ b. $y = -x + 8$ c. $y = -5x + 16$ d. $y = -10x + 26$