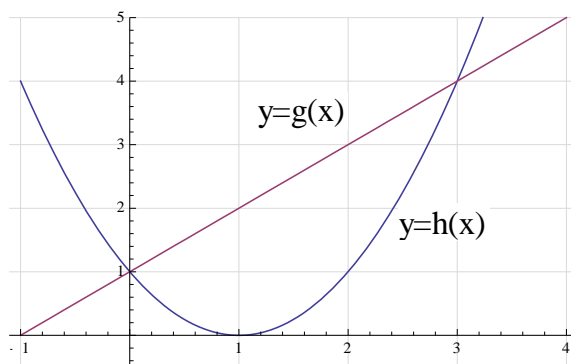


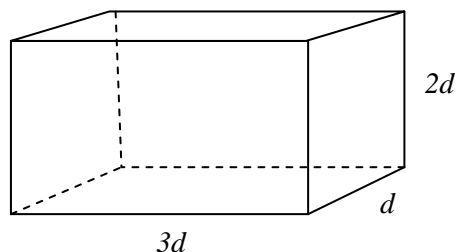
SAMPLE CALCULUS PLACEMENT EXAM

This sample placement exam is intended only to give you an idea of the type of material that you will encounter on the Drew University Calculus Placement exam. It is not meant to be comprehensive. The actual calculus placement exam will consist of 25 multiple choice questions. You will have 45 minutes to complete the exam. You will not be able to use calculators.

1. If $\log_3(27) = x + 4$, what is x ?
2. Solve the following linear system:
$$y = -4x + 5$$
$$4x + 3y = 31$$
3. Based on the graph below, for what values of x is $g(x) < h(x)$?



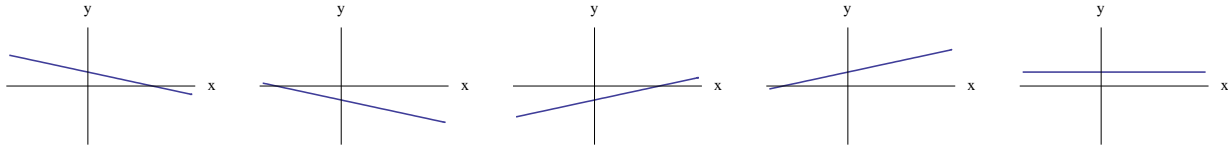
4. If the box shown below has a top and if its surface area is 32 units^2 , find its dimensions.



5. If the number of cells in a culture doubles every hour, how many cells will be in the culture after a full day if at the beginning of the day there is a single cell in the culture?
6. Find the y -intercept of the line that passes through the points $(5,3)$ and $(-1, -1)$.
7. Simplify the expression: $\frac{(x^4)^2 x^{-3}}{x^2 + x^5}$
8. Sketch the graph: $y = (x + 3)(x - 2)$.

9. Simplify: $(-2)^{-3}(8)^{\frac{1}{2}}$

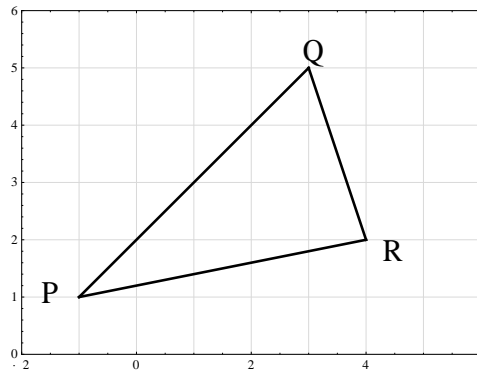
10. Which of the following could be the graph of the equation $2x + 3y = 5$?



11. Factor the expression: $x^3 - x$

12. What values of x are solutions to the inequality $3|x - 5| > 2$?

13. What is the length of the side PQ in the triangle shown below:



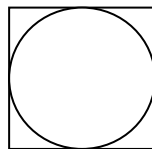
14. If $h(x) = -2^x - x^2$, find $h(-1)$.

15. Sketch the graph: $y = 2^x$.

16. What is the domain of the function $(x) = \frac{x-1}{x^2+8x+16}$?

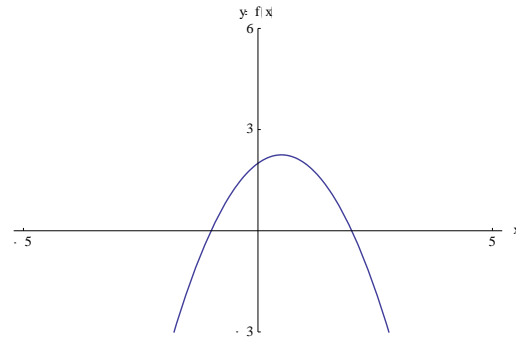
17. If $g(x) = \frac{(x-3)(x+1)}{x}$, find $g(a - 1)$.

18. The square shown below has area 16 units². What is the area of the inscribed circle?

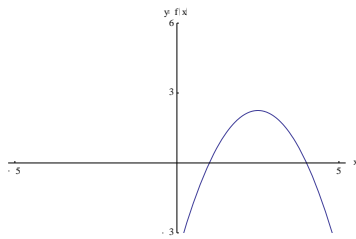


19. Find the center and the radius of the circle with equation $x^2 + y^2 - 4x + 12y + 30 = 0$.

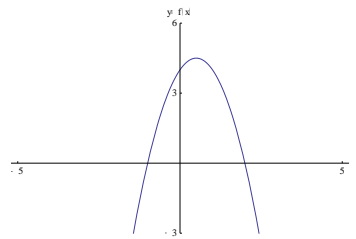
20. If the graph of function $y = f(x)$ is shown below, which of the graphs A, B or C could be the graph of $y = f(x + 2)$?



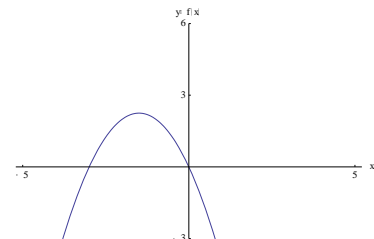
A



B



C



21. What is the domain of the function $y = \sec(x)$?

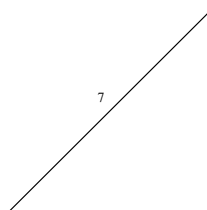
22. Fill in the following table of values:

θ	$\sin \theta$	$\cos \theta$	$\tan \theta$
0			
$\pi/6$			
$\pi/4$			
$\pi/3$			
$\pi/2$			
π			

23. Simplify the following expression: $(\sin x)^3 \cot(x) \sec(x)$

24. Sketch the graph: $y = \cos(x/2)$

25. An isosceles right triangle with hypotenuse length 7 is shown below. Give the length of the remaining two sides of the triangle.



SAMPLE CALCULUS PLACEMENT EXAM ANSWERS

1. -1

2. $(-2, 13)$

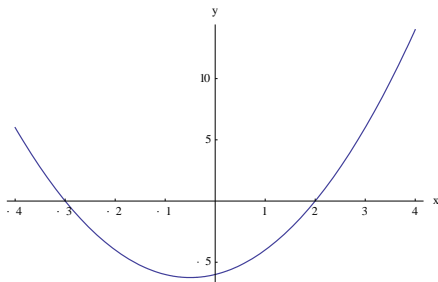
3. $x < 0$ or $x > 3$

4. $\frac{12\sqrt{11}}{11} \times \frac{4\sqrt{11}}{11} \times \frac{8\sqrt{11}}{11}$

5. 2^{24}

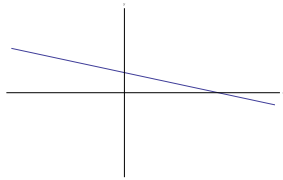
6. $\frac{-1}{3}$

7. $\frac{x^3}{1+x^3}$



8.

9. $\frac{-\sqrt{2}}{4}$



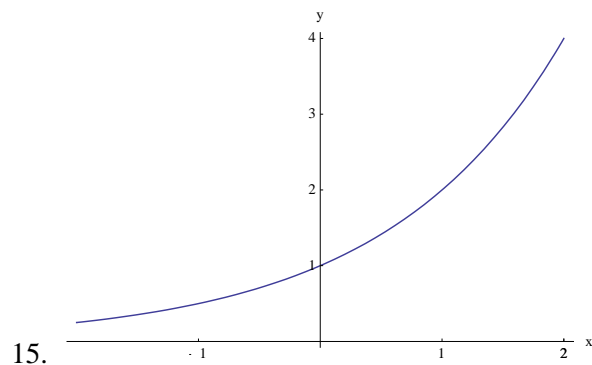
10.

11. $x(x+1)(x-1)$

12. $x < \frac{13}{3}$ or $x > \frac{17}{3}$

13. $4\sqrt{2}$

14. $\frac{-3}{2}$



15.

16. $x \neq -4$

17. $\frac{a(a-4)}{a-1}$

18. 4π

19. center: $(2, -6)$ radius: $\sqrt{10}$

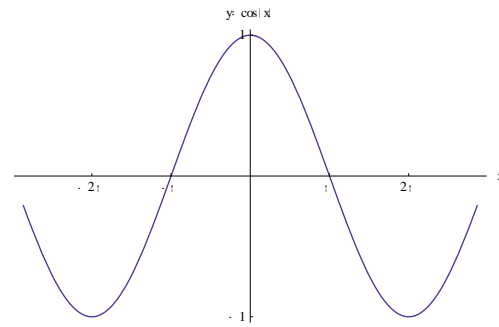
20. C

21. all values of x except odd multiples of $\frac{\pi}{2}$

θ	$\sin \theta$	$\cos \theta$	$\tan \theta$
0	0	1	0
$\pi/6$	$1/2$	$\sqrt{3}/2$	$\sqrt{3}/3$
$\pi/4$	$\sqrt{2}/2$	$\sqrt{2}/2$	1
$\pi/3$	$\sqrt{3}/2$	$1/2$	$\sqrt{3}$
$\pi/2$	1	0	Undefined
π	0	-1	0

22.

23. $(\sin(x))^2$



24.

25. $\frac{7\sqrt{2}}{2}$