

Summer Review for upcoming Calculus students (2018 – 2019)

- *This work should be completed and turned in our first class after returning from the summer*
 - *Please do not use a graphing calculators on these problems*
 - *Write your answers in simplest form*
 - *Use <https://www.khanacademy.org/math/algebra-home> for extra practice and help*
 - *Reviewing your Precalculus/Math Analysis during the summer will help you enjoy Calculus next year – this will best serve its purpose if you work on it a little at a time*
 - *Feel free to email me with questions Lhaase@Fredericksburgacademy.org*
 - *Enjoy your summer break!*
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1. Factor $9x^2 - 25$ _____

2. Simplify $\frac{2}{x-1} - \frac{3}{x+1}$ _____

3. Simplify $\frac{\frac{x^2+2x+1}{4x^2-9}}{\frac{x+1}{2x-3}}$ _____

4. Solve $18x^2 - 3x = 15$ by factoring _____

5. Solve $3x^2 + 4x - 7 = 0$ by completing the square _____

6. Solve $2x^2 - 5x + 4 = 0$ by using the quadratic formula _____

7. Solve $x^4 + 7x^2 - 8 = 0$ _____

8. Solve $2|3x + 5| = 8$ _____

9. Solve $|3x - 2| \leq 4$ _____

10. Solve $|2x + 1| > 3$ _____

11. Rationalize the denominator and simplify $\frac{\sqrt{6} - \sqrt{2}}{\sqrt{6} + \sqrt{2}}$ _____

12. If $f(x) = x - 1$ and $g(x) = 2x^2 - 1$, find $g(f(x))$ _____

13. Find the domain of the function $f(x) = \sqrt{x^2 - 4}$ _____

14. If $f(x) = x^3 + 2x^2$ and $g(x) = -2x$, find $(f \circ g)(1)$ _____

15. Find the inverse function of $f(x) = \frac{2}{3}x^3 + 1$ _____

16. Simplify $(3^{\sqrt{8}})^{\sqrt{2}}$

17. Simplify $(2x^{-3}y^4)(5x^2y^{-1})$

18. Simplify $(-2\sqrt{3})(5\sqrt{6})$

19. Simplify $\sqrt{18} - \sqrt{50} + \sqrt{12} - \sqrt{75}$

20. Simplify $\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$

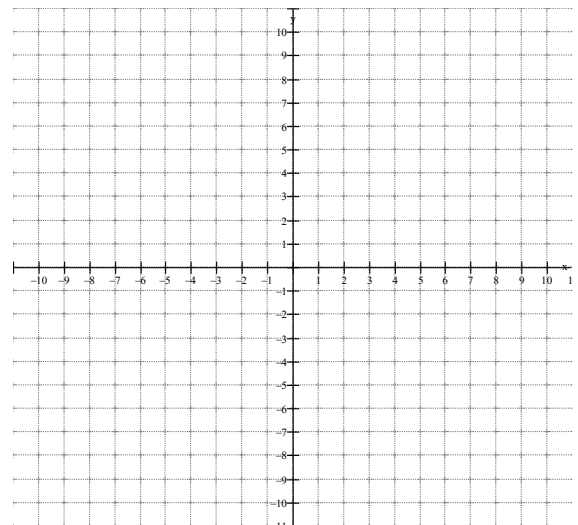
21. How is the graph of $y = 2f(x) + 3$ obtained from the graph of $y = f(x)$?

22. How is the graph of $y = -f(x + 2) - 5$ obtained from the graph of $y = f(x)$?

23. What is the domain of the function $f(x) = \frac{3}{x^2-4}$?

24. Solve $\frac{-2x}{x^2-1} + \frac{3}{x} = \frac{2}{x-1}$

25. Graph the function $f(x) = \begin{cases} 2, & \text{if } x < -3 \\ -2x + 4, & \text{if } -3 \leq x < 6 \\ \frac{x}{2}, & \text{if } x \geq 6 \end{cases}$



26. Solve $\log_3 x + \log_3(x-6) = 3$ _____

27. Express $\log_7(x^2y) - 6\log_7 x + 2\log_7 y$ as a logarithm of a single expression _____

28. Evaluate $\log_2 8 - \log_3 9 + \ln e^4$ _____

29. Solve $2^{x^2+1} = 32$ _____

30. Solve $\log 7 + \log(x-2) = \log(6x)$ _____

31. Change $\frac{2\pi}{9}$ to degree measure _____

32. Find the following: $\cos(-180^\circ)$ _____

$\sin(-270^\circ)$ _____

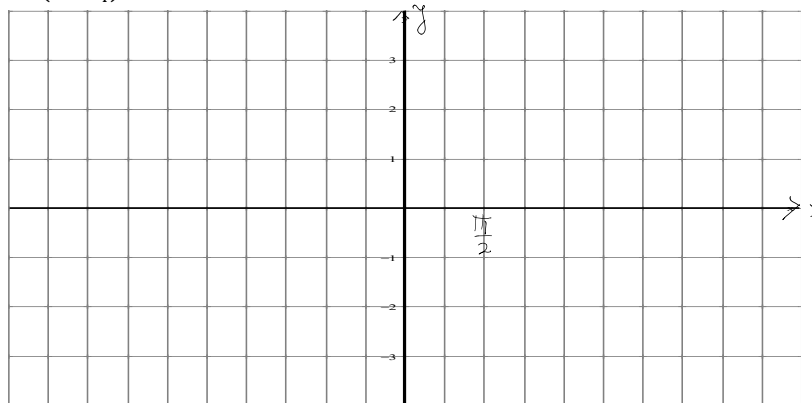
$\tan(450^\circ)$ _____

$\sec\left(\frac{5\pi}{6}\right)$ _____

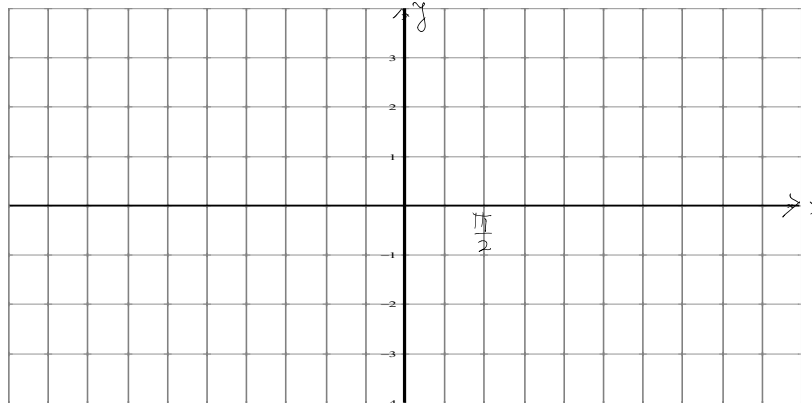
$\csc\left(\frac{11\pi}{3}\right)$ _____

$\cot\left(\frac{3\pi}{4}\right)$ _____

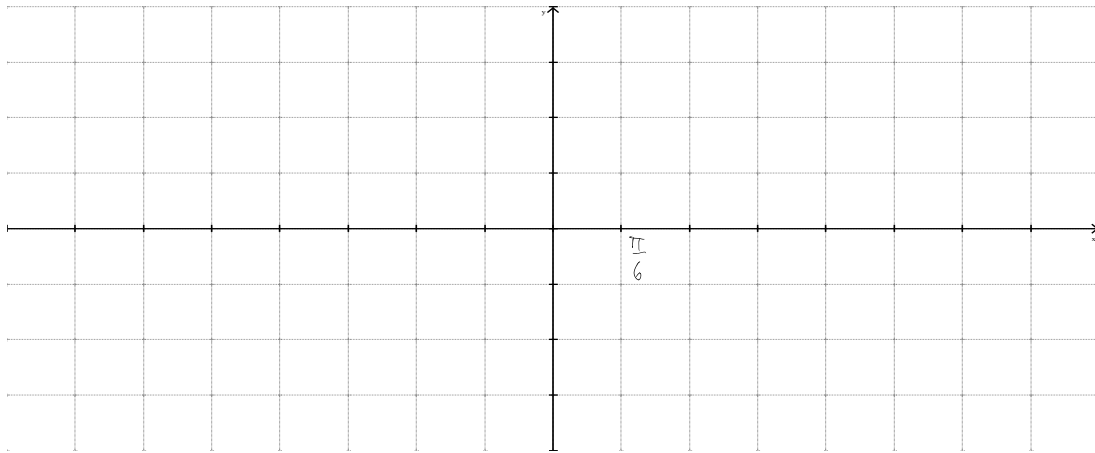
33. Graph $y = 2\sin\left(x - \frac{\pi}{4}\right) - 1$. Show one complete cycle.



34. Graph $y = 2\cos\left(x + \frac{\pi}{4}\right) + 1$. Show one complete cycle.

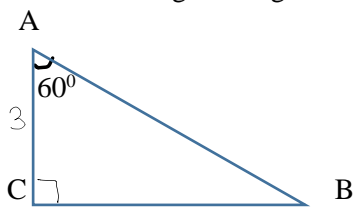


35. Sketch the graph of $y = \tan(3x)$. Include two full cycles.



36.

Solve the right triangle ABC.

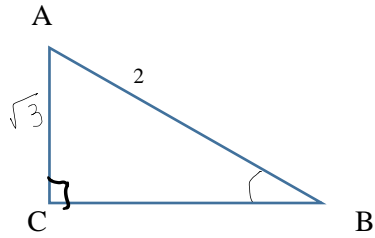


$$\angle ABC = \underline{\hspace{2cm}}$$

$$a = \underline{\hspace{2cm}}$$

$$c = \underline{\hspace{2cm}}$$

1. Solve the right triangle ABC



$$\angle ABC = \underline{\hspace{2cm}}$$

$$\angle BAC = \underline{\hspace{2cm}}$$

$$a = \underline{\hspace{2cm}}$$

Please have the following formulae thoroughly memorized. If I give you the expression on the left (or something similar), you need to quickly give me the equivalent expression on the right and conversely.

$$(a + b)^2 = a^2 + 2ab + b^2$$

$$(a - b)^2 = a^2 - 2ab + b^2$$

$$(a + b)(a - b) = a^2 - b^2$$

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$

$$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$$

$$(a + b)(a^2 - ab + b^2) = a^3 + b^3$$

$$(a - b)(a^2 + ab + b^2) = a^3 - b^3$$