

Calculus

Summer Math Packet 2021

Dear Students,

The teachers in the math department are very excited about the upcoming school year. We look forward to working with you and helping you to become successful in your math classes.

The problems in this packet are a review of concepts that you have learned in your previous math classes. A strong knowledge of this material will help you in your future math classes.

Here are some **suggestions** for the summer math packet:

- Print the packet or get a printed copy from the school
- Work on one page at a time
- Do NOT wait until the end of the summer to complete the whole packet
- Use your notes from previous math courses or watch videos online for extra help if needed (<https://www.khanacademy.org/>, <http://patrickjmt.com/>)

Please show all of your work and circle your final answers for each question. You will turn the completed packet into your teacher on the first day of school. The packet will be your first grade of the year. Students who follow all instructions and turn their packets in with all work shown on the first day of school will receive a homework pass.

Email us if you have any questions. We will answer emails when we can over the summer.

- Mae Margaret Davis – Algebra I, Geometry, Honors Geometry, and Business Calculus (mdavis@lee-scott.org)
- Neally Lewis - Dual Enrollment Cal I, Cal II, Dual Enrollment Pre-Calculus, and Finite Math (nlewis@lee-scott.org)
- Becky Mullis – 7th Grade Math and 10th Grade Algebra 2 (bmullis@lee-scott.org)
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- Barrett Odom - ACT Prep Math (bodom@lee-scott.org)

Thank you and have a great summer!

LSA Math Department

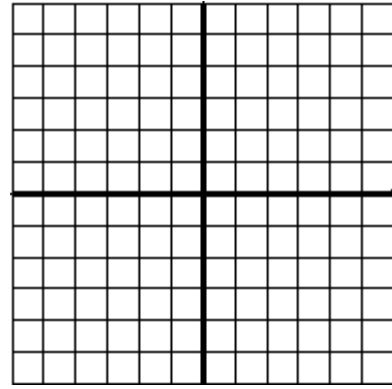
Show all of your work. Circle your answers.

1. Solve the quadratic equation using the quadratic formula, $3z^2 - 2z = 7$

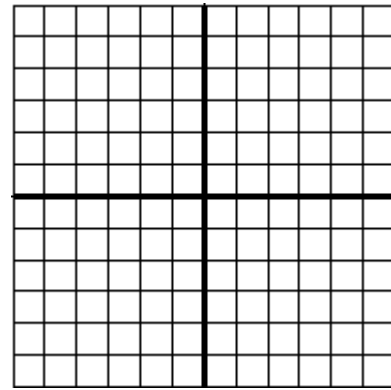
2. Multiply the complex numbers, $(\sqrt{3} - 12i)^2$

3. Solve the polynomial inequality, $x^2 + 4x - 12 \leq 0$

4. Graph the equation, $y = 2x + 1$

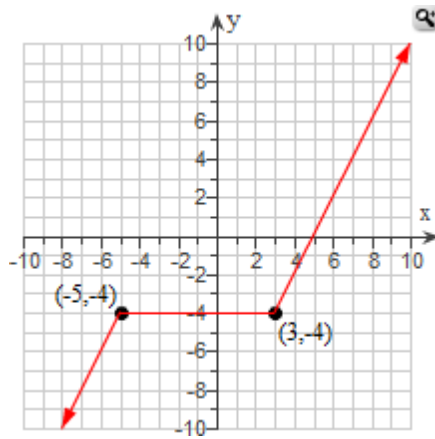


5. Graph the equation, $y = 2x^2 + 1$



6. Determine the domain of the function, $f(x) = \frac{2x}{x^2 - 1}$. State your answer in interval notation.

7. Determine intervals on which a function is increasing, decreasing or constant. Write your answer in interval notation.



Increasing:

Decreasing:

Constant:

8. Find the difference quotient of the function, $f(x) = x^2 + 1$

Difference Quotient: $\frac{f(x+h) - f(x)}{h}$

For questions #9 , #10, and #11 use the functions $f(x) = 2x + 3$ and $g(x) = x^2 + 3x - 5$

9. Find $f + g$

10. Find fg

11 Find $f \circ g$

12 Find the vertical and horizontal asymptotes of the function, $f(x) = \frac{2x^2}{x^2 - 4}$

13 Expand the logarithmic equation completely, using the logarithmic rules, $\log \frac{x \sqrt{x+1}}{(x-1)^2}$

14 Solve the exponential equation, $e^{2x} = 15$ (Give exact answer.)

15 Solve the logarithmic equation, $\log x + \log(x+9) = 1$

16 Convert radian measure into degree measure, $\frac{11\pi}{6}$

17 Find the vertical rise (to the nearest foot) for a ski lift with slope length 2050 feet assuming that the angle formed by a horizontal line at the top terminal and the lift cable is 16° (Draw a picture to help you.)

18 Find the exact value of $\sin 540^\circ$ (No calculator)

19 Find the exact value $\tan \theta$ given $\cos \theta = -\frac{5}{13}$, θ in quadrant III

20 Find the exact value of $\cos 1860^\circ$ (No calculator)

21 Sketch the graph of the sine function (one period)

22 Find the exact value of y or state that y is undefined, $y = \sin^{-1}\left(\frac{-1}{2}\right)$ (No calculator)

23 Use a sketch to find the exact value of y , $y = \cos\left(\sin^{-1}\frac{2}{3}\right)$ (No calculator)

24 Use the information about the angle θ to find the exact value of $\sin 2\theta$

$$\sin \theta = \frac{3}{5}, \theta \text{ in quadrant II}$$

25 Find all solutions to the equation, $\cos x = \frac{\sqrt{2}}{2}$ (Express answer in radians)

26 Find all solutions of each equation in the interval $[0, 2\pi]$, $4\sin^2 x = 1$

27 Find the angle between the vectors, $\mathbf{v} = -2\mathbf{i} - 3\mathbf{j}$, $\mathbf{w} = \mathbf{i} + \mathbf{j}$

28 Solve the system of equations,

$$3x - y = 5$$
$$x + y = 7$$

29 Solve the equation, $x^3 = 2x^2$