Mr. Fitch's Math Classes Extended Spring Break Packet 3 (May 6-22, 2020)

ALL CLASSES: Continue to complete your journals, same requirements as the first two packets. Feel free to utilize this journal for other class requirements but make sure you meet the specific requirements for your "math" journal. The requirements for the "math" journal are as follows:

- Five (5) dated entries per week minimum, 10 entries minimum for the two weeks.
- Neatly organized with proper spelling, grammar, and punctuation, bullet points are fine.
- Include any math you used/saw in at least two (2) entries per week.

Each class has assignments listed below, use your time wisely (15-20 minutes per day) and spread these out over the next two weeks, don't wait until the last minute, all assignments will be due when we hopefully return or the next scheduled drop-off date. Answer all questions to the best of your abilities and use your resources to research and investigate. Complete the assignments in the order listed in order to best understand the material. Feel free to email me any questions you may have and I will get back to you as soon as possible (brandon.fitch@leonagroup.com or brandon.fitch@wildwoodisgreen.com).

Online Office Hours (ZOOM): Thursdays 3:00pm-3:50pm: You are not required to attend these.

ALGEBRA 1: (aox45os)

- Lessons 3 and 4: Advanced Factoring Strategies for Quadratic Expressions– Complete Notes and Problem Sets
- Lesson 5: The Zero Product Property – Complete Notes and Problem Set
- Solving Quadratic Equations by Factoring Worksheet – Use what you learned in the notes to complete the worksheet – SHOW ALL WORK

PRECALCULUS (tuhoisb)

- Chapter 4 Test and Trigonometric Functions Test – SHOW ALL WORK

ALGEBRA 2: (e5qngje)

- Lesson 39: Factoring Extended to the Complex Realm – Complete Notes and Problem Set
- Lesson 40: Obstacles Resolved – A surprising Result – Complete Notes and Problem Set
- Complex Numbers and Quadratics Worksheet – Use what you learned in the notes to complete the worksheet – SHOW ALL WORK

GEOMETRY: (m562cco)

- Lessons 25: Incredibly Useful Ratios - Complete Notes and Problem Set
- Trig Functions Powerpoint – Read the notes and answer the questions on the slides
- Lesson 26: Definition of Sine Cosine and Tangent – Complete the Notes and Problem Set
- Trigonometric Ratios Worksheet – Use what you learned in the notes to complete the worksheet.

These assignments will take us through the remainder of the school year. Thank you all for a fun first year at WEA. Seniors, best of luck in all you do and don't hesitate to reach out in the future. Underclassmen, I look forward to seeing you all in the fall when we can hopefully return to a normal school year. Everyone, get this packet done and start enjoying your summer!

Mr Fitch

Precalculus: Trigonometric Functions Test

Multiple Choice
Identify the choice that best completes the statement or answers the question.

      Write the letter for the correct answer in the blank at the right of each question.

_____ 1. Rewrite 1400° in radians as a multiple of π.

    a. $\dfrac{70\pi}{9}$ c. $\dfrac{140\pi}{9}$

    b. $\dfrac{35\pi}{9}$ d. none of these

_____ 2. **TIRES** Tires are rotating at a rate of 18 revolutions per minute. Find the angular speed of the tires in radians per minute.

    a. 9π rad/min   c. 36π rad/min

    b. 18π rad/min   d. 72π rad/min

_____ 3. Let $\tan\theta = \dfrac{7}{24}$, where $\sin\theta > 0$. Find the exact value of $\sin\theta$.

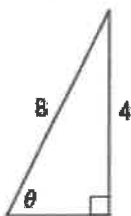   a. $\dfrac{7}{25}$ c. $\dfrac{24}{7}$

    b. $\dfrac{7}{24}$ d. $\dfrac{24}{25}$

_____ 4. Find the exact value of $\cos\theta$.

    a. $\dfrac{1}{2}$ c. $\dfrac{\sqrt{3}}{2}$

    b. $\dfrac{\sqrt{3}}{3}$ d. 2

_____ 5. Identify all coterminal angle between -360° and 360° for the angle -120°.

    a. -240°   c. 240°

    b. 60°   d. 300°

_____ 6. **LOGO** A circular pizza box logo has a sector with a central angle of 80° and a diameter of 16 inches. Find the area of the sector.

    a. 44.7 in²   c. 178.7 in²

    b. 56.9 in²   d. 201.1 in²

_____ 7. Let (-2, -4) be a point on the terminal side of an angle θ in standard position. Find the exact value of sec θ.

    a. $\dfrac{\sqrt{5}}{2}$

    b. $\sqrt{5}$

    c. $-\dfrac{\sqrt{5}}{2}$

    d. $-\sqrt{5}$

_____ 8. Write an equation of the tangent function with period $\dfrac{3\pi}{8}$, phase shift $-\dfrac{\pi}{5}$, and vertical shift -2.
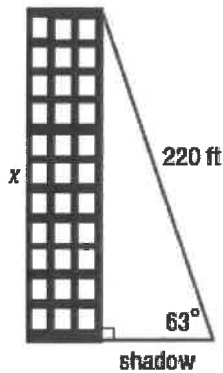
    a. $y = \tan\left(\dfrac{8x}{3} - \dfrac{8\pi}{15}\right) - 2$

    b. $y = \tan\left(\dfrac{16x}{3} - \dfrac{3\pi}{80}\right) - 2$

    c. $y = \tan\left(\dfrac{8x}{3} + \dfrac{8\pi}{15}\right) - 2$

    d. $y = \tan\left(\dfrac{8x}{3} - \dfrac{3\pi}{40}\right) - 2$

_____ 9. **ARCHITECTURE** The angle of elevation from the tip of a building's shadow to the top of the building is 63° and the distance is 220 feet. Find the height of the building to the nearest foot.

    a. 100 ft

    b. 112 ft

    c. 178 ft

    d. 196 ft

_____ 10. Assuming an angle in Quadrant I, find the exact value of $\tan\left(\cos^{-1}\dfrac{4}{5}\right)$.

    a. $\dfrac{3}{4}$

    b. $\dfrac{4}{3}$

    c. $\dfrac{4}{5}$

    d. $\dfrac{5}{4}$

_____ 11. State the period of $y = 2\sin(4x + \pi) - 1$.

    a. -1

    b. 2

    c. $\dfrac{\pi}{2}$

    d. π

_____ 12. Find $\arcsin\left(\dfrac{\sqrt{3}}{2}\right)$, if it exists.
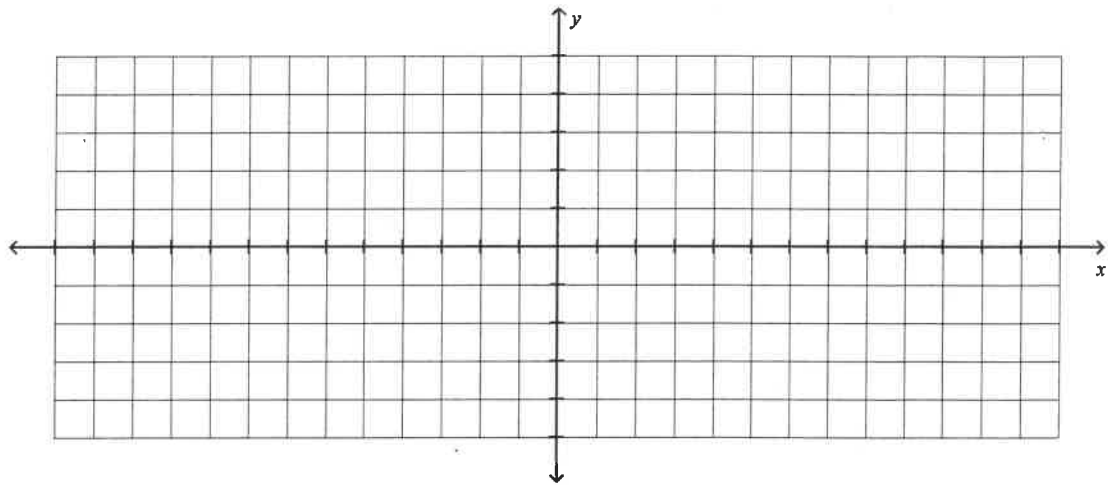
    a. 30°

    b. 60°

    c. 120°

    d. does not exist

_____ 13. **RAMP** The side view of a skateboard ramp is a triangle ABC with $A = 41°$, $B = 107°$, $c = 19$ feet. Find b.
  a. 10.5 ft   c. 27.7 ft
  b. 13.0 ft   d. 34.3 ft

_____ 14. Which of the following is a vertical asymptote for the graph of $y = \sec x + 3$? Graph 2 periods of this function.

  a. $x = \dfrac{\pi}{2}$ c. $x = 0$

  b. $x = \pi$ d. $x = 3$

_____ 15.
  In $\triangle DEF$, $D = 52°$, $d = 14$, and $f = 9$. Find e.
  a. 8.2   c. 11.1
  b. 11.0   d. 18.4

_____ 16. **GEOMETRY** Mrs. Lindsay designated a triangular area in the auditorium for art projects. The dimensions of the triangle are 32 feet, 26 feet, and 40 feet. What is the area of the triangle?
  a. 49.0 ft²   c. 296.6 ft²
  b. 121.0 ft²   d. 415.2 ft²

_____ 17. In $\triangle RST$, $r = 7.8$ in., $s = 4.2$ in., and $t = 3.9$ in. Find R.
  a. 15.1°   c. 78.9°
  b. 16.2°   d. 148.7°

Short Answer

18. **Bonus** The terminal side of an angle θ in standard position coincides with the line $2x - y = 0$ in Quadrant III. Find $\cos \theta$ to the nearest ten-thousandth.

Chapter 4 Test

Multiple Choice
Identify the choice that best completes the statement or answers the question.

_____ 1. Find the reference angle for 288°.

     a.   89°   c.   72°
     b.   59°   d.   108°

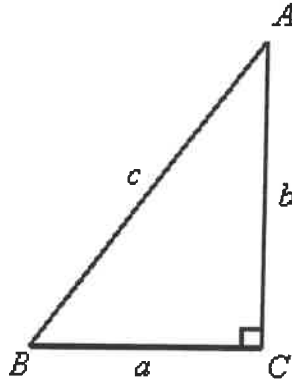_____ 2. Find the exact value of $\sin\frac{5\pi}{4}$.

     a. $\frac{\sqrt{2}}{2}$ c.   undefined

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

Short Answer

3. If $c = 18$ and $B = 63°$, find a. Round to the nearest tenth.

4. How many triangles are there that satisfy the conditions $a = 3$, $b = 4$, $\alpha = 76°$?

5. Change $\frac{4}{15}\pi$ radians to degree measure.

6. Change 135° to radian measure in terms of π.

7. Find the least positive angle measurement that is coterminal with −200°.

8. Find the reference angle for 114°.

9. Suppose θ is an angle in the standard position whose terminal side is in Quadrant I and $\tan\theta = 12/5$. Find the exact values of the five remaining trigonometric functions of θ.

10. Use the unit circle to find the value of $\sin(-120°)$.

11. State the amplitude and period of the function: $y = 2\cos\dfrac{9}{2}\theta$

12. Describe how the graphs of $f(x) = \cos x$ and $g(x) = 3\cos x$ are related. Then find the amplitude of $g(x)$, and graph 2 periods of both functions on the same graph. Make sure to label the functions.

13. State the amplitude, period, and phase shift of $y = 2\sin\left(2x - \dfrac{\pi}{3}\right)$.

14. Write an equation for the given function given the period, phase shift, and vertical shift. cosecant function, period $= 2\pi$, phase shift $= \dfrac{1}{8}\pi$, vertical shift $= 4$

15. Find the value of $\operatorname{Sin}^{-1}\left(-\dfrac{\sqrt{2}}{2}\right)$.

16. Find the value of cosArctan.

$$\cos\left(3\operatorname{Arc}\tan\dfrac{2}{4}\right)$$

17. Solve triangle ABC given that $A = 58°$, $B = 58°$, and $b = 13$.

18. Find all solutions for the triangle with $e = 37, f = 22, E = 105°$. If no solutions exist, write *none*. Round to the nearest tenth.
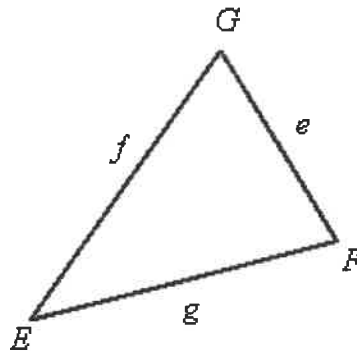
19. Given a triangle with $b = 7$, $c = 3$, and $A = 71°$, what is the length of a? Round to the nearest tenth.

20. Find the area of the triangle with $a = 27$, $b = 11$, $c = 21$. Round to the nearest tenth.

21. Graph 2 periods of $y = \sin x$. Then graph $y = \csc x$.