

Name: \_\_\_\_\_

**Algebra II CP Final Exam Review Packet**

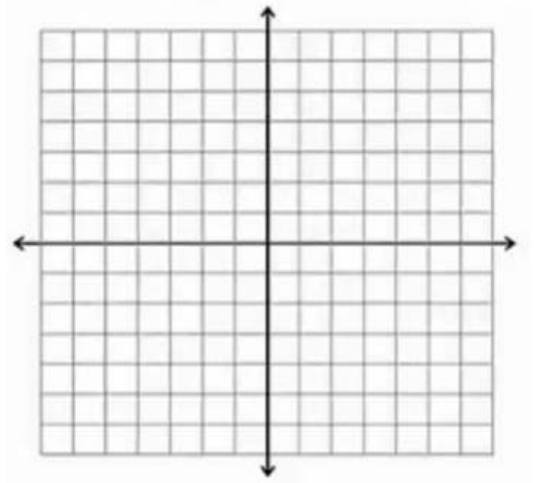
**Calculator Questions**

1. Solve the equation. Check for extraneous solutions. (Sec. 1.6)

$$|2x + 8| = 3x + 7$$

2. Graph the inequality  $y < 3x + 1$ . (Sec. 2.8)

3. If  $y$  varies directly with  $x$ , and  $y = 12$  when  $x = 2$ , find  $y$  when  $x = 0.3$ .



4. Solve the system of equations using any method of your choice. (Sec. 3.2)

$$\begin{cases} x = 2y + 3 \\ 3x + y = -5 \end{cases}$$

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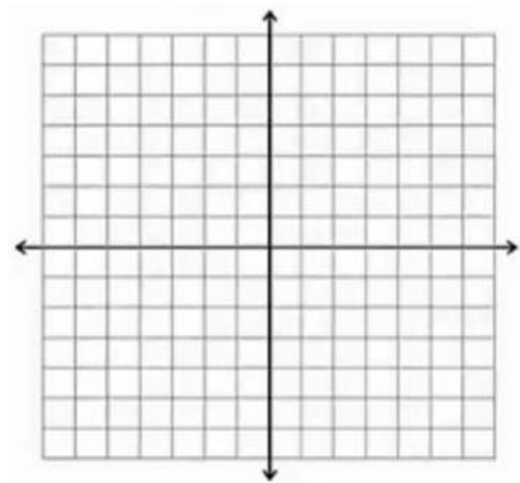
$$\begin{cases} 2x + 3y = 4 \\ 4x + 6y = 9 \end{cases}$$

6. Solve the system using matrices in your calculator. (Sec. 3.6)

$$\begin{cases} x + y + z = 4 \\ 2x - y + z = 5 \\ x + y - 2z = 13 \end{cases}$$

7. Solve the system of inequalities by graphing (Sec. 3.4)

$$\begin{cases} y < \frac{1}{4}x \\ 3x + y \geq 6 \end{cases}$$



8. The equation  $h = -16t^2 + 32t + 9$  gives the height of a ball after  $t$  seconds. When will the ball reach its maximum height? What is the maximum height? (Sec. 4.2)

9. Solve with the quadratic formula. (Sec. 4.7)

$$2x^2 - 6x + 3 = 0$$

10. Simplify each expression. (Sec. 4.8)

a.  $\sqrt{-64}$

b.  $(9 + 7i) - (6 - 2i)$

c.  $(1 - 9i)(3 + 2i)$

11. Divide the polynomials using long division. (Sec. 5.4)

$$(x^3 + 7x^2 + 15x + 9) \div (x + 1)$$

12. Divide the polynomials using synthetic division (Sec. 5.4)

$$(x^3 + 5x^2 - x - 5) \div (x + 5)$$

13. Simplify. Rationalize denominator if necessary. (Sec. 6.2)

a.  $\sqrt{8x^2} \times \sqrt{2x^2}$

b.  $\frac{\sqrt[3]{5}}{\sqrt[3]{3x^2y}}$

14. Solve. Check for extraneous solutions. (Sec. 6.5)

$$2 + \sqrt{x + 5} = 4$$

15. Let  $f(x) = x - 4$  and  $g(x) = x^2 - 16$ . (Sec. 6.6)

a. Find  $(f \circ g)(7)$ .

b. Find  $(g \circ f)(x)$ .

16. Find the inverse of the function. Determine if the inverse is a function or not. (Sec. 6.7)

$$f(x) = \sqrt{x - 10}$$

17. If \$3000 is invested into an account that compounds continuously at 2.8%, how much will be in the account after 2 years? (Sec. 7.2)

18. The population of the town of Logville increases by 1.3% each year. If the current population is 16,000 people, in how many years will the population reach 22,000 people? (Sec. 7.5)

19. Solve for x:  $\log_2 4x = 5$  (Sec. 7.5) Hint... B.O.M.

20. Solve. Round to the nearest hundredth.  $\ln 4 - \ln x = 2$  (Sec. 7.6)

21. Write an equation for the translation of  $y = \frac{1}{x}$  with asymptotes  $x = 3$  and  $y = 6$ . (Sec. 8.2)

22. Simplify and state any restrictions. (Sec. 8.4)

$$\frac{x^2+x-6}{x-5} \times \frac{x^2-25}{x^2+4x+3}$$

23. Simplify and state any restrictions. (Sec. 8.4)

$$\frac{4x^2-2x}{x^2+5x+4} \div \frac{2x}{x^2+2x+1}$$

24. Simplify the sum. State any restrictions. (Sec. 8.5)

$$\frac{3x}{x^2-4} + \frac{6}{x+2}$$

25. Solve: (Sec. 8.6)

$$\frac{1}{x} = \frac{5}{x-4}$$

26. Evaluate:  ${}_{10}C_5$  (Sec. 11.1)

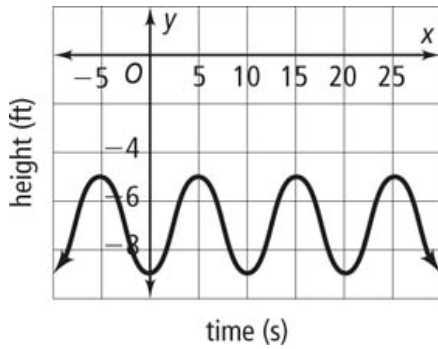
27. Convert to either radians or degrees. (Sec. 13.2)

a.  $\frac{2\pi}{5}$

b.  $-130^\circ$

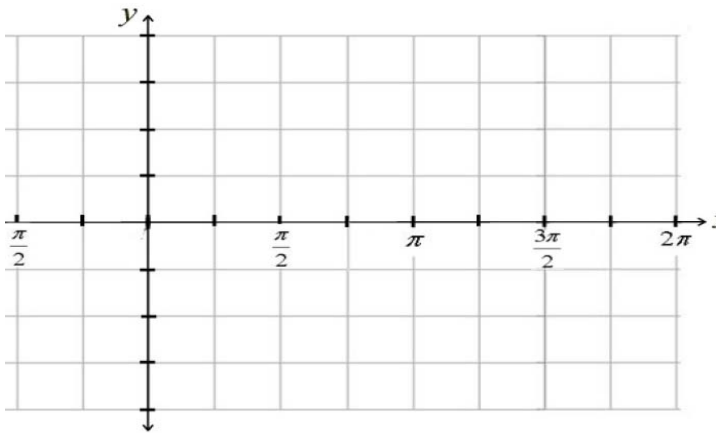
c.  $4\pi$

28 The graph below shows the height of ocean waves below the deck of a platform. (Sec. 13.1)



- What is the period of the graph?
- What is the equation of the midline of the graph?
- What is the amplitude of the graph?

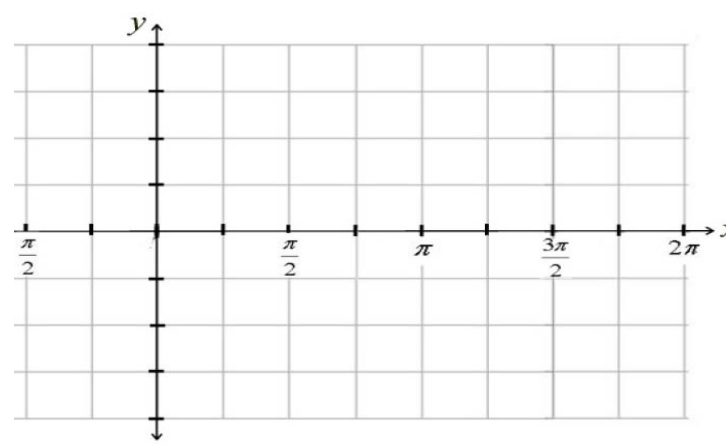
29. Sketch the graph of  $y = \frac{1}{2} \cos(2\theta)$  in the interval from 0 to  $2\pi$ . (Sec 13.5)



30. Sketch **one cycle** of the sine curve below. Assume  $a > 0$ . Write the equation for the graph. (Sec. 13.4)

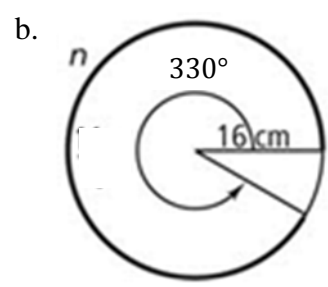
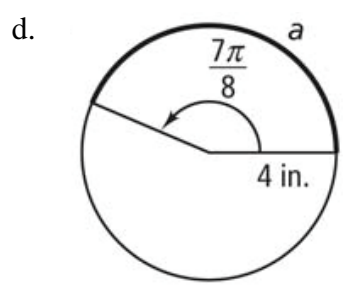
Amplitude=2.5

Period= $2\pi$



Equation: \_\_\_\_\_

31. Use each circle to find the length of the indicated arc. Round your answer to the nearest tenth. (Sec. 13.3)



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**NON - Calculator Questions**

1. Give 2 examples of a number in each subset. (Sec. 1.1)

a. Rational Numbers

b. Integers

c. Irrational Numbers

d. Natural Numbers

2. Determine if the relation below is a function or not. Explain your reasoning. (Sec. 2.1)

$\{(10, 2), (-10, 2), (6, 4), (5, 3), (-6, 7)\}$

3. Write the equation of a line in slope-intercept form that goes through (2, 3) and (3, 5). (Sec. 2.4)

4. Describe the transformation of the parent function  $y = |x|$  in the equation  $y = -2|x + 4| - 3$ . (Sec. 2.7)

5. Identify the vertex, axis of symmetry, domain, and range for the function. (Sec. 4.1)

$$y = 4(x + 2)^2 - 6$$

6. Solve by factoring: (Sec. 4.5)

a.  $x^2 - 8x = -12$

b.  $3x^2 + 11x - 20 = 0$



7. Write the expression in standard form. State the degree of the polynomial. (Sec. 5.1)

$$y = 2x^3 - 6x + 3x^2 - x^4 + 12$$

8. State the zeros and their multiplicities of the following polynomial. (Sec. 5.2)

$$y = x(x - 4)(2x + 3)^2$$

9. Determine the equation of the cubic function obtained from the parent function  $y = x^3$  after a translation 1 unit up and 2 units right. (Sec. 5.9)

10. Simplify: (Sec. 6.4)

a.  $27^{\frac{2}{3}}$

b.  $(8y)^{\frac{1}{3}}$

c.  $(x^{\frac{1}{3}})^{-18}$

11. Determine whether the equations represent exponential growth or exponential decay. (Sec. 7.1)

a.  $y = 0.2(3.8)^x$

b.  $y = 100(0.5)^x$

12. Write in logarithmic form:  $6^4 = 1296$  (Sec. 7.3)

Write in exponential form:  $\log_2 16 = 4$

13. Evaluate each logarithm. (Sec. 7.3)

a.  $\log_4 64$

b.  $\log 10,000$

c.  $\log_2 32$

d.  $\log_3 \frac{1}{27}$

14. Express each as a single logarithm. (Sec. 7.4)

a.  $4 \log x + \log 7$

b.  $\log 5 - 3 \log x$

15. Determine any vertical asymptotes or holes in the given equations. (Sec. 8.3)

a.  $y = \frac{x^2+x-6}{x^2-x-2}$

b.  $y = \frac{x^2-4}{x+2}$

16. Find the horizontal asymptotes (if any) of the graph of each rational function. (Sec. 8.3)

a.  $y = \frac{2x^2+3x-1}{x^2+5}$

b.  $y = \frac{4x}{x^3-10}$

c.  $y = \frac{x^4+3}{x}$

17. Simplify: (Sec. 8.5)

$$\frac{2-\frac{2}{x}}{3-\frac{1}{x}}$$

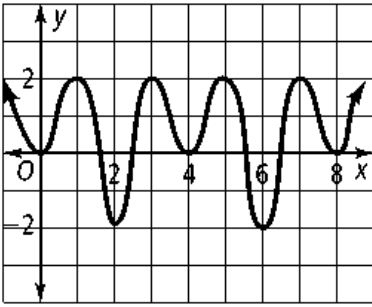
18. In class, there are 25 students: 11 girls (5 freshmen and 6 sophomores) and 14 boys (5 freshmen and 9 sophomores). (Sec. 11.3)

a. What is the probability that a randomly selected student is a girl **or** a sophomore?

b. What is the probability that a randomly selected student is a girl **and** a sophomore?

19. Explain the key difference between a **permutation** and a **combination**. (Sec. 11.1)

20. Determine the period and altitude of the following periodic function. (Sec. 13.1)



21. Using a unit circle, determine the following values. (Sec. 13.2 and 13.3)

a.  $\cos 120^\circ$

b.  $\sin \frac{5\pi}{3}$

c.  $\tan \frac{3\pi}{4}$

d.  $\tan -450^\circ$