

The problems in this packet are intended to review what you should already know from previous classes, not to teach you new information. The skills selected are those frequently used in calculus. You should attempt every problem. Spread the work out over the summer. If you get stuck you might try an algebra 2 or precalculus review book. You may also email me, Mrs. Marotte at amarotte@pasco.k12.fl.us, type APCALC in the subject line and please identify yourself by name in the email. This is due the first day of class.

- Write an equation of the line
 - with a slope of 2 and a y-intercept of -3
 - with a slope of $-\frac{2}{3}$ and passing through $(-1, 4)$
 - passing through $(3, 5)$ and $(6, 2)$
 - parallel to $2x - 4y = 8$ passing through the point $(1, -2)$.
 - perpendicular to $2x - 4y = 8$ passing through the point $(1, -2)$.
 - which is the perpendicular bisector of the line segment joining $(2, 6)$ and $(8, 0)$

- Simplify the following:

$$\text{a. } \frac{x^3}{x^{-5}} \quad \text{b. } \frac{x^2 - 4x - 5}{x^2 + 2x + 1} \quad \text{c. } \frac{x - 4}{4 - x} \quad \text{d. } (x - 1)^3 \quad \text{e. } x^{\frac{1}{3}} x^{\frac{3}{5}}$$

- Solve

$$\text{a. } \frac{2}{x+1} = \frac{x-2}{2} \quad \text{b. } x^2 - 9x + 9 = 0 \quad \text{c. } \frac{1}{x} + x = 4 \quad \text{d. } \frac{5}{e^x + 1} = 1 \quad \text{e. } \sqrt{x-1} - \frac{5}{\sqrt{x-1}} = 0$$

- Graph without a calculator:

$$\begin{array}{llll} \text{a) } y = (x - 3)^2 + 2 & \text{b) } y = (x + 1)^3 & \text{c) } y = 2 - \sqrt{x} & \text{d) } y = e^{-x} \\ \text{e) } y = \ln(x - 1) & \text{f) } y = \sqrt[3]{1 - x} & \text{g) } y = 2\sin x & \text{h) } y = \cos \pi x \\ \text{i) } y = \tan x + 1 & \text{j) } y = 2|x - 3| & \text{k) } y = \frac{1}{x+1} & \end{array}$$

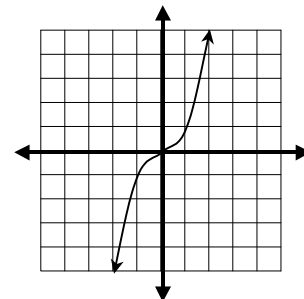
- Graph and label all asymptotes of $y = \frac{2x}{x-4}$

- Graph $(x - 2)^2 + y^2 = 5$ and $(y + 2)^2 - x^2 = 16$.

- Which relations are functions?

$$\begin{array}{llll} \text{a) } xy = 3 & \text{b) } \sqrt{y} = 2x & \text{c) } xy^2 = 7 & \text{d) } x + 3y = 5 \\ \text{e) } x^2 + (y - 2)^2 = 4 & \text{f) } \frac{1}{x} + 2y = 9 & \text{g) } y^2 = x^2 + 3 & \end{array}$$

- Find the domain, range, and inverse of the graph.



9. If $f(x) = \frac{x}{x-1}$ and $g(x) = \frac{1}{x-1}$, find $(f \circ g)(x)$.

10. Solve the following.

a) $4t^3 - 12t^2 + 8t = 0$ b) $3\sqrt{x-2} - 8 = 8$ c) $2 \ln 3x = 4$ d) $\frac{x-5}{3-x} \geq 0$

e) $\left|2 - \frac{x}{3}\right| < 5$ f) $4e^{2x} = 5$ g) $(x-4) - 5(x-4)^{1/2} = 6$ h) $2\sin^2 x = \sin x + 1; 0 \leq x \leq 2\pi$

11. Solve algebraically

$$\begin{cases} 5a + 3b = 9 \\ 2a - 4b = 14 \end{cases}$$

12. Solve using matrices

$$\begin{cases} x + 4z = 13 \\ 4x - 2y + z = 7 \\ 2x - 2y - 7z = -19 \end{cases}$$

13. Factor

a) $3x^3 + 192$ b) $2x^3 - 11x^2 + 12x + 9$ c) $2x^{5/4} + x^{3/4} - 15x^{1/4}$ d) $9x^2 - 3x - 2$

14. Simplify the following.

a) $2 \ln(x-3) + \ln(x+2) - 6 \ln x$ b) $\frac{\frac{2}{x} - 3}{1 - \frac{1}{x-1}}$ c) $x(1-2x)^{-3/2} + (1-2x)^{-1/2}$

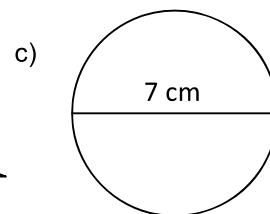
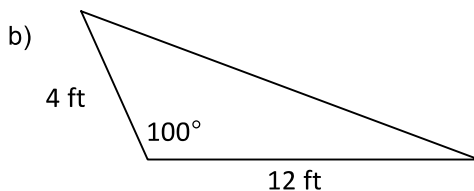
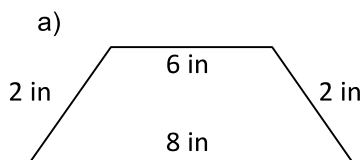
15. Simplify

a) i^{27} b) $(7+3i)(5-i)$

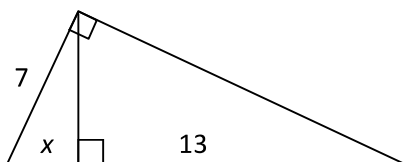
16. Find each summation.

a) $\sum_{i=1}^{\infty} 3\left(\frac{1}{2}\right)^{i-1}$ b) $\sum_{i=1}^n (i^2 - 3i + 2)$

17. Find the area and perimeter (or circumference) of each figure.



18. Find x .



19. Find the following.

a) $\sin \frac{7\pi}{6}$ b) $\cos 120^\circ$ c) $\tan \frac{\pi}{2}$ d) $\csc 60^\circ$ e) $\sec \left(-\frac{2\pi}{3} \right)$ f) $\cot(-135^\circ)$

20. Simplify.

a) $4\sin 2x \cos 2x$ b) $1 - \sec^2 x$ c) $\frac{1 + \cos 2x}{2}$ d) $\cos^2 x - \sin^2 x$ e) $\cos^2 x + \sin^2 x$

21. A 20-foot ladder rests against a building 15 feet from the floor. How far does the ladder extend from the base of the wall? What angle does the ladder make with the ground?

22. Solve the following for the principal values of the indicated variable.

a) $3\cos x - 1 = 2$ b) $2\sin(2x) - \sqrt{3} = 0$ c) $\tan^2 x - 1 = 0$

23. Complete the following trig identities.

a) $\sin^2 x + \cos^2 x =$ b) $\frac{1}{\sin x} =$ c) $\sin^4 x - \cos^4 x =$ d) $\tan^2 x + 1 =$ e) $\sin 2x =$

24. Solve

a) $\log_2 64 =$ b) $\log_6 (36 \times 6^{-7})$ c) If $\log w = \frac{1}{2} \log x + \log y$, then $w =$

25. Evaluate: Answer must be in radians.

a) $\cos 0$ b) $\sin 0$ c) $\tan \pi/2$ d) $\cos \pi/4$ e) $\sin \pi/2$ f) $\sin \pi$ g) $\arctan 1$

26. Solve for x.

a) $\ln e^3 = x$ b) $\ln e^x = 4$ c) $\ln x + \ln x = 0$ d) $e^{\ln 5} = x$ e) $\ln 1 - \ln e = x$

f) $\ln 6 + \ln x - \ln 2 = 3$ g) $\ln(x + 5) = \ln(x - 1) - \ln(x + 1)$

27. Evaluate the limit

a) $\lim_{x \rightarrow 3} (x^2 + 2)$ b) $\lim_{x \rightarrow 3} \frac{(x + 3)(x - 4)}{(x + 3)(x + 1)}$ c) $\lim_{x \rightarrow 25} \frac{\sqrt{5} - 5}{x - 25}$

d) $\lim_{x \rightarrow 2} \frac{x - 4}{x^2 - 2x - 8}$ e) $\lim_{x \rightarrow 3} \frac{x^2 + 2x - 3}{x^2 + 7x + 12}$ f) $\lim_{x \rightarrow 2} \frac{x^3 + 8}{x + 2}$

g) $\lim_{x \rightarrow 8} \frac{1}{x - 8}$ h) $\lim_{x \rightarrow 5} \frac{x - 5}{|x - 5|}$