

Directions: Multiple Choice. Defend your choice. No calculator.

If you cannot recall the topic, do some research (use your text etc.) If you use an outside source you must give credit and cite the source.

We will be collaborating as a class to fill in what holes remain. So do not panic if you cannot recall EVERYTHING.

_____ 1. If $f(x) = x - 2$ and $g(x) = |x - 2|$ Then $g(f(-3)) =$
(A) -7 (B) -3 (C) 3 (D) 7 (E) None of these

_____ 2. The graph of the equation $y = 2x^5$ exhibits which of the following symmetries? There may be more than one answer – give all that apply.
(A) x-axis (B) y-axis (C) Origin
(D) $y = x$ (E) No symmetry

_____ 3. Let $f^{-1}(x)$ be the inverse function of $f(x) = x^3 + 2$. Then $f^{-1}(x) =$
(A) $\frac{1}{x^3 - 2}$ (B) $(x + 2)^3$ (C) $(x - 2)^3$ (D) $\sqrt[3]{x+2}$ (E) $\sqrt[3]{x-2}$

- _____ 4. The domain of $f(x) = \frac{\sqrt{x-2}}{x^2-x}$ is
- (A) all $x \neq 0, 1$ (B) $x \leq 2, x \neq 0, 1$ (C) $x \leq 2$
(D) $x \geq 2$ (E) $x > 2$

- _____ 5. The equation of all lines parallel to $3x + 5y = 8$ is:
- (A) $3x - 5y = k$ (D) $3x + 5y = k$
(B) $5x - 3y = k$ (E) $5x + 3y = k$
(C) $y = \frac{3}{5}x + k$

Free Response.

6. Find the values of A and B such that $f(-4)$ is undefined and $f(3) = 0$

$$f(x) = \frac{2x - A}{3x - B}$$

Calculator Active or use DESMOS

7. Transform the parametric equations to a Cartesian equation by eliminating the parameter. **Describe** the graph of the relationship you see.

a. $x = 3 - t$
 $y = 1 + 12t$

b. $y = 3\sin(t)$
 $x = 3\cos(t)$

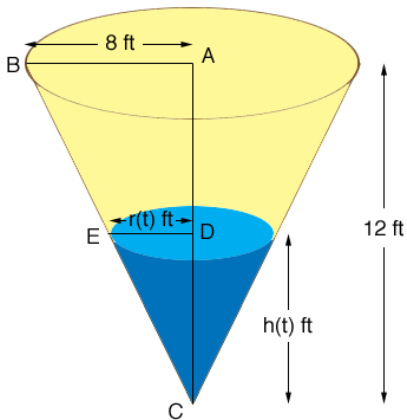
8. Write y as a function of x , a and c are constants : $e^{2y+c} = \sqrt{x-a}$

9. Are the functions, $f(x) = x - 4$ and $g(x) = \frac{x^2 - 16}{x + 4}$ the same?

Explain fully. Include diagrams to support your work,

10. Water is flowing at a rate of $2 \text{ ft}^3/\text{s}$ into the conical tank. The height of the tank is 12 ft and the diameter is 16 ft.

- Find the volume V of the water as a function of the water level h .
- Find h as a function of the time t during which water has been flowing into the tank.



11. Does $f(x) = \frac{1}{(x+1)^{2/3}}$ have an inverse **function**? Explain.

Back to No calculator for 12-13

12. Graph the function $f(x) = 3 \sin(2\theta) + 1$ on $[0, 2\pi]$

13. Evaluate each. Exact answers only. Try to do these quickly.

$$\sin(225^\circ) \qquad \sin(\cos^{-1}(0.5)) \qquad \sec\left(\frac{\pi}{2}\right) \qquad \tan\left(-\frac{\pi}{4}\right)$$

$$\csc\left(\frac{2\pi}{3}\right) \qquad \cos\left(\frac{7\pi}{6}\right) \qquad \sin^2\left(\frac{8\pi}{11}\right) + \cos^2\left(\frac{8\pi}{11}\right) \qquad \tan(\sin^{-1}(1))$$

$$\tan(-330^\circ) \qquad \sin(-60^\circ) \qquad \cos(30^\circ) + \sin(30^\circ)$$

14.

a. Give your best definition of or explanation of the “limit” concept. Include diagrams etc to support ideas.

b. Research the “formal” definition of “limit” and report what you find. Include your sources.

15. Give your best definition of a continuous function. Try to do this from prior memory... then look it up and see how well you could recall.

Include counter examples to illustrate ideas from your prior learning.

Day 1 Notes

READY? SET? GO!

We begin with proving a limit you are very familiar with:

$$\lim_{\theta \rightarrow 0} \frac{\sin(\theta)}{\theta}$$