

F=Fun at home **I**=Incunabula **V**=Variety **E**=Endeavors **S**=Specimens

Thursday, 9/21

F #16 p.178 #11-14, p. 181 #20-22

- I** 1. 25 percent of 16 is equivalent to $\frac{1}{2}$ of what number? A) 4 B) 8 C) 11 D) 13 E)16
2. If $(y + 2)^2 = (y - 2)^2$, what is the value of y? A) 0 B) 1 C) 2 D) 4 E) 6

V p. 93 # 32

- E** 1. To find the derivative of functions whose exponents contain variables
2. How many times can you win the lottery?

- S** 1. Find $\frac{dy}{dx}$ if $y = 2^x$. 2. Find $\frac{dy}{dx}$ if $y = x^{\cos x}$ 3. Find $\frac{dy}{dx}$ if $y = \sin^{-1}(2x^3)$

Example: (See "Special Technique" on Derivative Rules Sheet)

Find $\frac{dy}{dx}$ if $y = 2^x$: Take ln of both sides: $\ln y = \ln 2^x$
Move exponent down: $\ln y = x \ln 2$
Take derivative: $\frac{1}{y} \frac{dy}{dx} = \ln 2$
Multiply by y: $\frac{dy}{dx} = (\ln 2) y$
Replace y with its value
in terms of x: $\frac{dy}{dx} = (\ln 2) 2^x$

Friday, 9/22

F #17 p. 170 #1-7 odd, 19, 21, 37 and do these three problems:

1. Find $\frac{dy}{dx}$ if $y = x^{\sin x}$
2. Find $\frac{dy}{dt}$ if $y = 5^{-\cos t}$
3. Find $\frac{dy}{d\theta}$ if $y = 2^{\sin 3\theta}$

See your "Derivative Rules Sheet" and the textbook for formulae for the derivatives of inverse trig functions and also for the "special technique" for taking derivatives whose exponents contain variables.

I SAT Sponges 27, 28

V p.518 (22)

- E** 1. To find the derivatives of cot x, sec x, csc x, and inverse trig functions.

Monday, 9/25

F #17.5 p. 535 # 7-15 odd, p. 170 # 4,14 p. 178 #18,20

I SAT sponges 38, 45

V The entire surface of a solid cube with edge of length 6 inches is painted. The cube is then cut into cubes each with edge of length 1 inch. How many of the smaller cubes have paint on exactly 1 face?

- E** 1. To find the derivative of functions defined parametrically.
2. To get ready for the upcoming test on derivatives.

- S** 1. Find $\frac{dy}{dx}$ if $y = 3t^2 - 2$ and $x = 4t + 1$. 2. Find $\frac{dy}{dx}$ if $y = t^2 + 2t - 1$ and $t = x + 1$.

3. Find $\frac{dy}{dx}$ if $y = t - \frac{1}{t}$ and $x = 1 + \frac{1}{t}$

Tuesday, 9/26

F #18 Worksheet #7 1-16

I SAT sponges 29, 30

V The entire surface of a solid cube with edge of length 6 inches is painted. The cube is then cut into cubes each with edge of length 1 inch. How many of the smaller cubes have paint on exactly 1 face?

E 1. To find the derivative of \square with respect to Δ . 2. To get ready for the upcoming test on derivatives.

S 1. Find the derivative of y^2 with respect to $\ln x$ if $y = \sqrt{x+1}$. 2. Find $\frac{d(e^{3x})}{d(\sin x)}$.

Wednesday 9/27

F #19 Worksheet #8 1-15

I 1. The solution set of $\frac{7}{x^2 + 8x + 23} = 1$ is A) {8,4} B) {8,-4} C) {-4,-4} D) {4,-4} E) {16,1}

2. Given the equation $\frac{7x}{3} = (a^4 + 1)^3$, and $a = -1$, solve for x . A) 16 B) $\frac{24}{7}$ C) 24 D) $\frac{20}{3}$ E) 0

V Which is the greater quantity: Choose A, B, C if the same, or D if there is not enough information.

A: The average (arithmetic mean) of -3, 1, and 3

B: The average (arithmetic mean) of -3, 2, and 3

E 1. **Soon, class, soon!** 2. To review old and new rules for test tomorrow on derivatives.

S Lots of "notes" problems.

Thursday 9/28

Open House Tonight

F #20 p.66 (7,17,18,20,24)

I SAT sponges 31, 32

V The tangent to the curve $y^2 - xy + 9 = 0$ is vertical when

A) $y = 0$ B) $y = \pm\sqrt{3}$ C) $y = \frac{1}{2}$ D) $y = \pm 3$ E) none of these

E 1. **Easy test on derivatives.** 2. To review limits.

S 1. Find $\lim_{x \rightarrow 3} (6x - 2)$ 2. Find $\lim_{x \rightarrow 3} \frac{x^2 - 9}{x - 3}$ 3. Find $\lim_{x \rightarrow 3} \frac{x - 3}{x^2 - 8x + 15}$

Thursday, October 5

6 WK MAKEUP TEST Today

F #25 p.95# 1-20 and the following problems:

1. $\lim_{h \rightarrow 0} \frac{5(x+h)^4 - 5x^4}{h}$

2. $\lim_{h \rightarrow 0} \frac{\ln\{2(x+h)\} - \ln(2x)}{h}$

3. $\lim_{h \rightarrow 0} \frac{(8+h)^{1/3} - 2}{h}$

4. $\lim_{h \rightarrow 0} \frac{e^{(x+h)^2} - e^{x^2}}{h}$

5. $\lim_{h \rightarrow 0} \frac{\cos h - 1}{h}$

I SAT sponges 41, 42

V None

E 1. To find the limit of functions that are in the form of Newton's Quotient.

S 1. Find $\lim_{h \rightarrow 0} \frac{(x+h)^3 - x^3}{h}$ 2. Find $\lim_{h \rightarrow 0} \frac{(2+h)^3 - 8}{h}$

Friday, October 6

END OF THE 6 WK GRADING PERIOD

F #26 Worksheet #9 1-19

I SAT sponges 43, 44

V p.179 #52

E 1. To practice some limit problems for the upcoming test.

2. To find limits that involve bounded functions.

S 1. Find $\lim_{x \rightarrow 0} \frac{\sin x - 1}{x}$

2. Find $\lim_{x \rightarrow 1} \frac{x^2 - 2x + 1}{x - 1}$

3. $\lim_{x \rightarrow \infty} \sin x$

4. $\lim_{x \rightarrow \infty} \frac{\sin x}{x}$

5. $\lim_{x \rightarrow \infty} \frac{\cos x}{3x^2}$

6. $\lim_{x \rightarrow \infty} \frac{\sin \frac{x}{2}}{2x}$

7. $\lim_{x \rightarrow 1} \frac{3}{x-1}$

Monday, October 9

F #27 Worksheet #10 1-20

I SAT sponges 46

V p.230 (10)

E 1. Continue to work on finding limits. 2. Review of limits and some applications of derivatives for upcoming easy test.

S 1. Find $\lim_{h \rightarrow 0} \frac{\ln(e+h) - 1}{h}$ 2. Find slope of tangent line to curve $y = 3x^2 - 1$ at point (1,2).

Tuesday, October 10

F #28 Worksheet #11 1-15

I 1. If x and y are integers, for which of the following ordered pairs (x,y) is $2x + y$ an odd number?

A) (0,2) B) (1,2) C) (2,1) D) (2,4) E) 3,0

2. If $25 * 16 * 9 = r^2 * 3^2$, then $r^2 =$ A) 4^2 B) 5^2 C) 10^2 D) 15^2 E) 20^2

V A triangle has a base of length 13 and the other two sides are equal in length. If the lengths of the sides of the triangle are integers, what is the shortest possible length of a side?

E 1. To practice some limit problems for upcoming test.

S Many "notes" problems.

Wednesday, October 11

F #29 Worksheet #12 1–19

I 1. If $3x = y$ and $y = z + 1$, what is the value of x when $z = 29$?

2. If $2^n = 8$, what is the value of 3^{n+1} ?

V p.66 (54a) Show graph.

E 1. Continue to work on finding limits.

2. Final review of limits and some applications of derivatives for tomorrow's easy test.

S Be prepared for tomorrow's easy test!

Thursday, October 12

F #30 Worksheet 12.5

I SAT sponges 47, 48

V $\int \frac{\cos \sqrt{\theta}}{\theta \sin^2 \sqrt{\theta}} d\theta$ (Show all work)

E **1. Take an easy test on limits and some derivatives.**

2. Begin finding the antiderivative (integral) of a function.

S Studying for this test means knowing all of the different types of limit problems as well as those derivative problems.