

Name: Key

GTID: _____

Answer the questions in the spaces provided and put your answer in the BOX. Organize and show your work for full credit.

1. For this page use the function $f(x) = (x + 2)^3(x - 1)^2(x - 3)$.

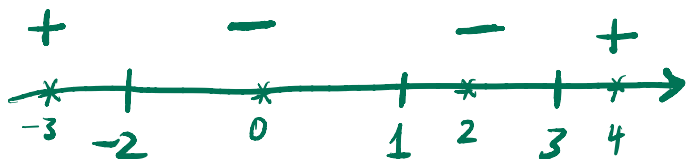
1a. State the roots of $y = f(x)$ and the multiplicity of each root. Also, for each root classify the intercept as crosses or touches.

Note: circle your answer.

$x =$	-2	with multiplicity	3	CROSSES /TOUCHES
$x =$	1	with multiplicity	2	CROSSES/ TOUCHES
$x =$	3	with multiplicity	1	CROSSES /TOUCHES

1b. Make a sign chart for $y = f(x)$ and determine the x -values where $y > 0$ or $y < 0$.

Note: Give your answer in interval notation or by using inequalities.



$y > 0$ on	$(-\infty, -2) \cup (3, \infty)$
$y < 0$ on	$(-2, 1) \cup (1, 3)$

$$f(x) = (x+2)^3(x-1)^2(x-3)$$

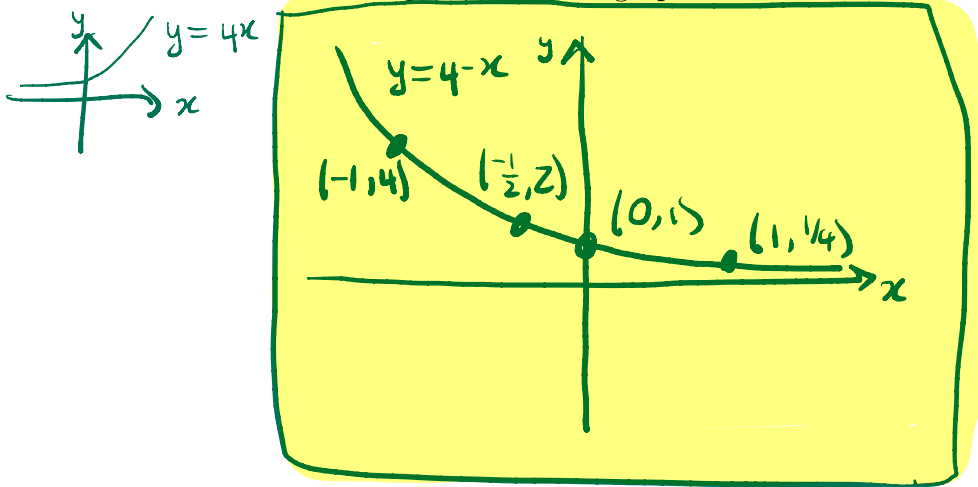
$x = -3$	-	+	-	$x = 4$	+	+	+
$x = 0$	+	+	-				
$x = 2$	+	+	-				

2. Evaluate: $y = \log_{\frac{1}{2}}(8) \iff \left(\frac{1}{2}\right)^y = 8$

so $\frac{1}{2^y} = 8 \Rightarrow 2^y = \frac{1}{8}$

$\Rightarrow \boxed{y = -3}$

3. Sketch: $y = 4^{-x}$. Label any intercepts, label the axes and the curve, and identify and include a total of at least four points on your graph for full credit.



4. An account earns simple interest at a rate of 10% per year. If \$2,000 is deposited, how much money is in the account after 8 years?

Note: you must clearly set up the problem, but you do not need evaluate the expression.

$$I = Prt \Rightarrow I = 2000(.1)(8)$$

$$\begin{aligned} P &= \$2,000 \\ r &= 0.1 \\ t &= 8 \end{aligned}$$

$$A = I + P$$

$$= \boxed{2000(.1)(8) + 2000} = \$3,600$$