

I. MULTIPLE CHOICE.

1. _____ WHERE IS THE HORIZONTAL ASYMPTOTE FOR THE FUNCTION $f(x) = \frac{4x-5}{2x+1}$?
A. $y = 5$ B. $y = 2$ C. $y = 4$
D. IT HAS NO HORIZONTAL ASYMPTOTE E. NONE OF THESE
2. _____ WHAT IS THE VERTICAL ASYMPTOTE FOR THE FUNCTION $f(x) = \frac{x-5}{x+5}$?
A. $x = 5$ B. $x = 2$ C. $x = 4$
D. IT HAS NO VERTICAL ASYMPTOTE E. NONE OF THESE
3. _____ WHAT IS THE X-INTERCEPT FOR THE FUNCTION $f(x) = \frac{x-5}{x+5}$?
A. $x = 5$ B. $x = 2$ C. $x = 4$
D. IT HAS NO X-INTERCEPT E. NONE OF THESE
4. _____ WHAT ARE THE X-INTERCEPTS OF THE $f(x) = x^3 - 4x^2 - 4x + 16$?
A. $x = \pm 2$ & $x = 4$ B. $x = 2$ & $x = \pm 4$ C. $x = \pm 2$ ONLY
D. IT HAS NO X-INTERCEPTS E. NONE OF THESE
5. _____ THE POINT $(-3, 0)$ IS AN X-INTERCEPT OF THE FUNCTION $f(x) = x(x+3)^3$. WHAT IS THE MULTIPLICITY OF THAT INTERCEPT?
A. 1 B. 2 C. 3
D. THIS CANNOT BE DETERMINED FROM THE GIVEN INFORMATION E. NONE OF THESE
6. _____ THE FUNCTION (WHICH IS ALREADY IN FACTORED FORM) $f(x) = (x-5)^2(x+7)$ HAS $x = -7$ AS AN X-INTERCEPT. WHAT IS THE MULTIPLICITY OF THAT INTERCEPT?
A. 1 B. 2 C. 3 D. 4 E. NONE OF THESE
7. _____ WHERE IS THE HORIZONTAL ASYMPTOTE FOR THE FUNCTION $f(x) = \frac{-10x^2}{x^2 - 6x + 5}$?
A. THE X-AXIS B. $y = -10$ C. $y = 1$ & $y = 5$
D. IT HAS NO HORIZONTAL ASYMPTOTE E. NONE OF THESE
8. _____ WHERE ARE THE VERTICAL ASYMPTOTE(S) FOR THE FUNCTION $f(x) = \frac{-10}{x^2 - 6x + 5}$?
A. $x = -2$ ONLY B. $x = -10$ ONLY C. $x = 1$ & $x = 5$
D. IT HAS NO VERTICAL ASYMPTOTES E. NONE OF THESE
9. _____ WHAT IS THE X-INTERCEPT FOR THE FUNCTION $f(x) = \frac{5x+10}{x^2 - 6x + 5}$?
A. $x = -2$ B. $x = -10$ C. $x = 1$ & $x = 5$
D. IT HAS NO X-INTERCEPT E. NONE OF THESE
10. _____ WHAT IS THE HORIZONTAL ASYMPTOTE OF THE FUNCTION $f(x) = \frac{18}{x^2 - 9}$?
A. $y = 18$ B. $y = \pm 3$ C. THE X-AXIS
D. IT HAS NO HORIZONTAL ASYMPTOTE E. NONE OF THESE

11. _____ WHICH FUNCTION HAS THE X-AXIS FOR ITS HORIZONTAL ASYMPTOTE?

- A. $f(x) = \frac{x^2}{x^2 + x - 6}$ B. $f(x) = \frac{x^2 + x - 6}{x^2}$ C. $f(x) = \frac{x^2}{x^2 - x - 6}$
D. $f(x) = \frac{x}{x^2 - x - 6}$ E. NONE OF THESE

II. SKETCH THE GRAPH OF EACH FUNCTION, SHOWING ALL YOUR WORK **AS DEMONSTRATED IN CLASS**.
LABEL ALL POINTS YOU PLOT!

1. $f(x) = x^3 + x^2 - 25x - 25$ 2. $f(x) = \frac{2x - 6}{x + 3}$

3. $f(x) = (-x + 2)(x + 1)^2$ 4. $f(x) = \frac{x + 1}{x^2 - 16}$

5. $f(x) = -x^4 - 6x^3 - 5x^2$ 6. $f(x) = \frac{x - 2}{x^2 - 9}$

7. $f(x) = x^3(x - 4)^2(x + 2)$