

AP Calculus

Worksheet: Sections 1.1-1.3

1. List the domain and range of each of the basic functions below.

(A) Identity function

(B) Square function

(C) Cube function

(D) Square root function

(E) Cube root function

(F) Absolute value function

(G) Exponential function, base e

(H) Natural logarithmic function

2. Given the polynomial $f(x) = a_5 x^5 + a_4 x^4 + a_3 x^3 + a_2 x^2 + a_1 x + a_0$, $a_5 \neq 0$ and answer the following questions.

(A) What is the degree of the polynomial?

(B) What is the maximum number of turning points of the graph?

(C) What is the maximum number of x-intercepts of the graph? What is the analytic interpretation of the x-intercepts?

(D) What is the minimum number of x-intercepts?

(E) Why must the graph have exactly one y-intercept?

3. Given the rational function $f(x) = \frac{3x^2-3}{x^2+3x-4}$ answer the following questions.

(A) What is the y-intercept?

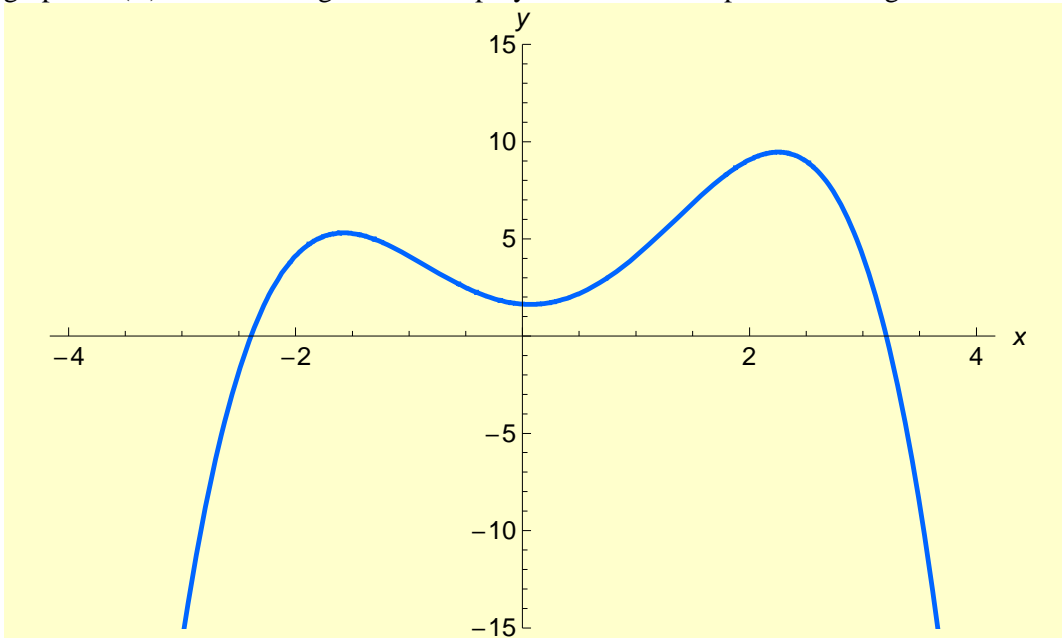
(B) What is the x-intercept?

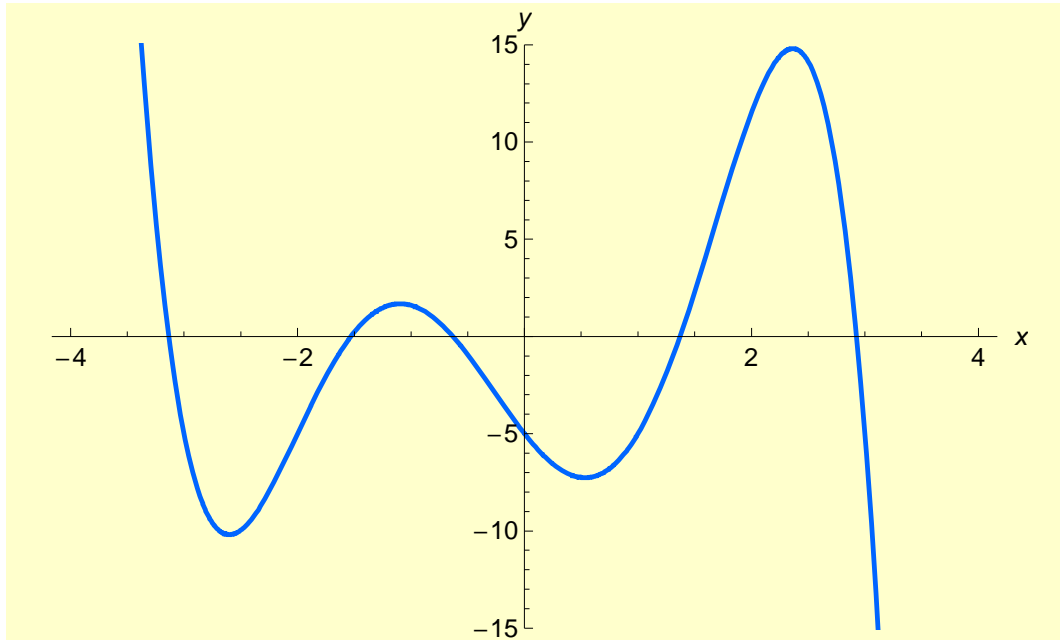
(C) What is the domain of f?

(D) Is there a horizontal asymptote? If so, state its equation.

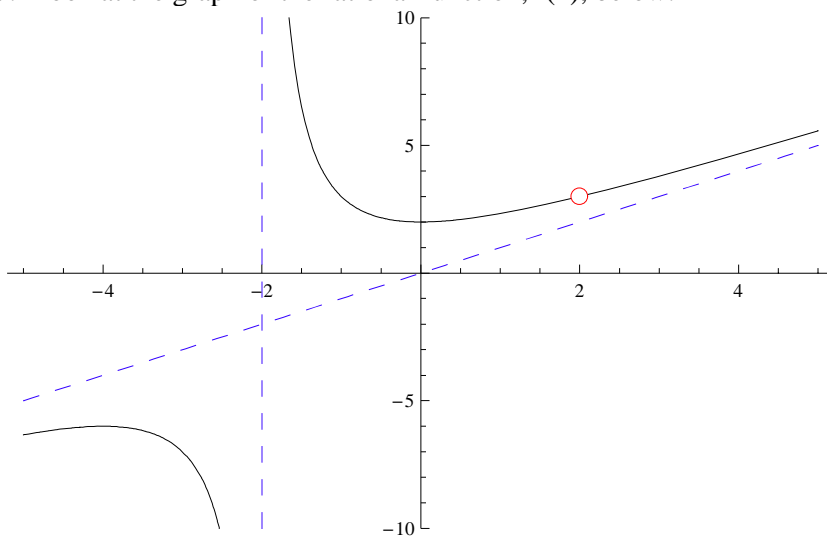
(E) Are there any vertical asymptotes? Any holes? If so, find them.

4. Each graph below is the graph of a polynomial function. Answer the following questions for each graph:
(A) How many turning points are on the graph? (B) What is the maximum degree of the polynomial that is graphed? (C) Is the leading coefficient polynomial function positive or negative?





5. Look at the graph of the rational function, $f(x)$, below.

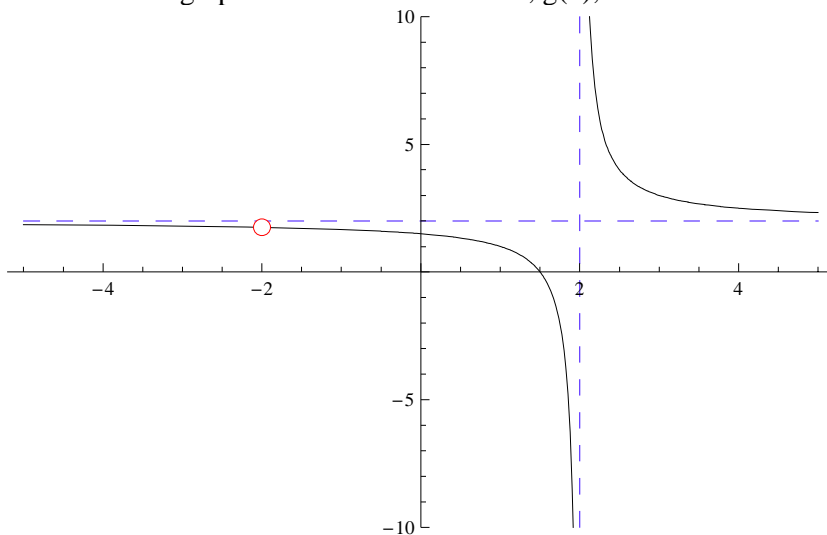


(A) State two polynomial factors that are in the denominator of f . How do you know these are factors?

(B) State one factor that is in the numerator.

(C) The graph has a slant, or oblique asymptote. What does this tell you about the relative degrees of the numerator and the denominator?

6. Look at the graph of the rational function, $g(x)$, below.



(A) State two polynomial factors of the denominator.

(B) State one polynomial factor of the numerator.

(C) The graph of g has a horizontal asymptote. What does this tell you about the relative degrees of the numerator and the denominator? The equation of the asymptote is $y = 2$. What does this tell you about the leading coefficients in the numerator and the denominator?

6. Convert the following degree measures to an equivalent radian measure.

(A) 45° (B) 150° (C) -210° (D) -330°

7. Convert the following radian measures to an equivalent degree measure.

(A) $\frac{\pi}{3}$ (B) $\frac{5\pi}{6}$ (C) $-\frac{7\pi}{4}$ (D) $-\frac{3\pi}{2}$

8. Find the exact value of each of the trigonometric expressions listed below.

(A) $\sin \frac{\pi}{4}$

(B) $\cos -\frac{7\pi}{6}$

(C) $\sin -\frac{5\pi}{3}$

(D) $\cos \frac{11\pi}{6}$