

## 3.5 WS

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Determine the vertical asymptotes of each rational function.

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

2.  $F(x) = \frac{x^2+11}{6x^2-5x-4}$

3.  $G(x) = \frac{5x^2-3}{4x^3-25x^2+6x}$

4.  $H(x) = \frac{2x}{3x^2+5}$

Determine horizontal asymptotes of each rational function.

5.  $P(x) = \frac{4x^2+1}{x^2+x+1}$

6.  $H(x) = \frac{3x^3-27x^2+5x-11}{x^5-2x^3+7}$

7.  $F(x) = \frac{4x^2-11x+6}{4-x+\frac{1}{3}x^2}$

Determine the vertical and horizontal asymptotes of each rational function.

8.  $F(x) = \frac{x}{x+4}$

9.  $G(x) = \frac{1}{x^2-9}$

10.  $F(x) = \frac{x^2+x+4}{x^2+2x-1}$

11.  $P(x) = \frac{10}{x^2+2}$

**Find the slant asymptote of each rational function.**

$$12. F(x) = \frac{3x^2 + 5x - 1}{x + 4}$$

$$13. H(x) = \frac{x^3 - 2x^2 + 3x + 4}{x^2 - 3x + 5}$$

$$14. P(x) = \frac{x^3 - 1}{x^2}$$

**Use the given zero to find the remaining zeros of each polynomial function.**

$$15. P(x) = x^3 + 3x^2 + x + 3; -i$$

$$16. H(x) = x^5 - 6x^4 + 22x^3 - 64x^2 + 117x - 90; 3i$$