

2.27 Homework: Rational expressions exam review

1. Use polynomial long division to find an expression of the form $ax + b + \frac{c}{x+d}$ with a, b, c, d integers that is equivalent to $\frac{3x^3 + 19x^2 + 15x}{x^2 + 4x}$ for $x \neq -4$ or 0 .

2. The polynomial p is a function of x . The graph of p has three zeros at 7 , $\frac{2}{3}$, and -1 . Select **all** the expressions that could represent p .

- | | |
|---|---|
| (a) $(x - 7)(x - \frac{2}{3})(x + 1)$ | (e) $(x - 7)(x + \frac{2}{3})(x - 1)$ |
| (b) $(x - 7)(3x - 2)(x - 1)$ | (f) $(x - 7)(3x - 2)(x + 1)$ |
| (c) $3(x - 7)(x - \frac{2}{3})(x + 1)$ | (g) $3(x - 7)(x - \frac{2}{3})(x - 1)$ |
| (d) $3x(x + 7)(x + \frac{2}{3})(x - 1)^2$ | (h) $3x(x + 7)(x - \frac{2}{3})(x + 1)^2$ |

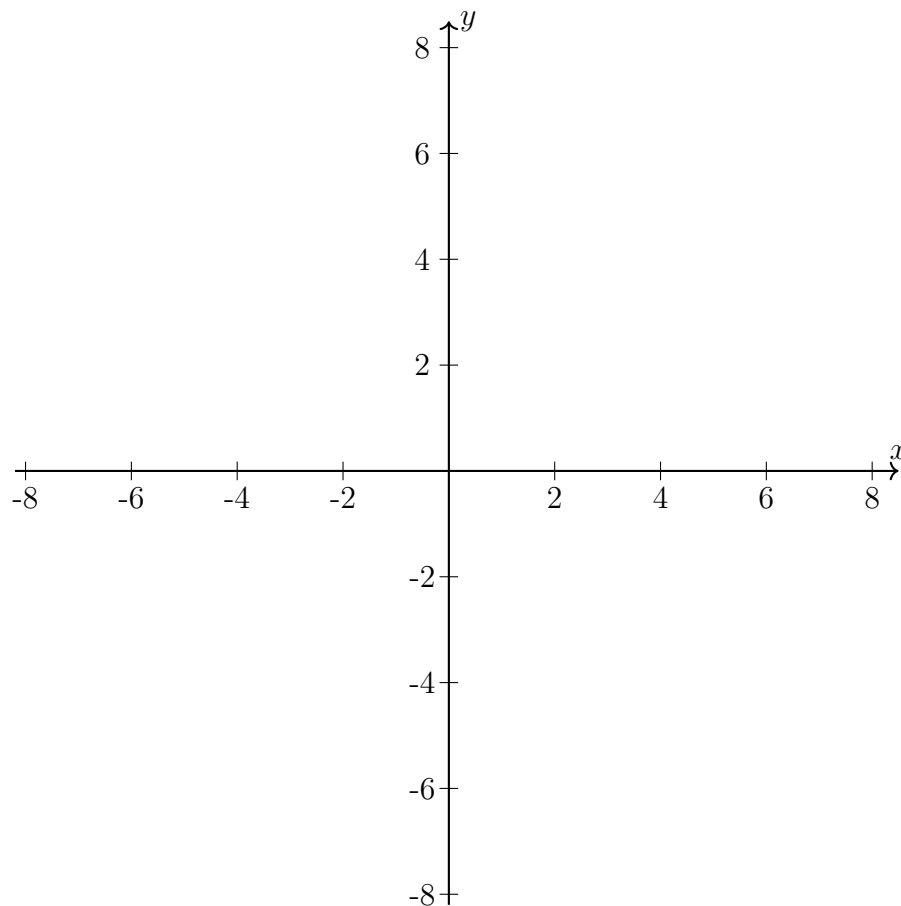
3. Let f be a polynomial function of x where $f(x) = 4x^3 - 11x^2 - 6x + 9$. If $x - 3$ is a factor of f , write an equation for f as a product of linear factors.

4. Given the rational function $r(x) = -2 + \frac{x-1}{x+2}$.

(a) Sketch a graph of the function.

(b) Mark the vertical asymptote as dotted line and label it with its equation.

(c) Explain why the asymptote is located there.



5. Find all values of x that make the equation true.

$$\frac{2x^2 - 3x - 5}{x^2 - 4x - 5} = \frac{2x + 1}{x - 5}$$