Evaluate the factorial expression $\frac{3!7!}{4!}$

Write down the first five terms of the sequence

$$\{a_n\} = \left\{(-1)^n\left(\frac{n+3}{n+2}\right)\right\}$$

Write out the sum

$$\sum_{k=0}^{n}\frac{1}{3^k}$$

d. Express the sum using summation notation.

$$a + ar + ar^2 + \cdots + ar^{n-1}$$

Find the 8th term of the geometric sequence 0.4, 0.04, 0.004, …

Find the sum $\sum_{k=1}^{\infty} 5\left(\frac{1}{4}\right)^{k-1}$

Don contributes $500 at the end of each quarter to a tax sheltered annuity (TSA). What will the value of the TSA be after the 80^{th} deposit (after 20 years) if the annual rate of return is assumed to be 8% compounded quarterly?

What is the domain of $\frac{2x-7}{x^2+5x-36}$?

Find the zeros of $g(x)=x^2+5x-36$ in 3 ways:

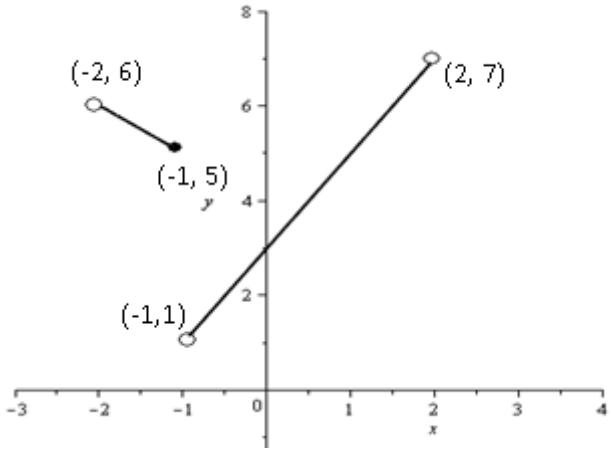
By factoring

By completing the square

By quadratic formula

Sketch the graph of $f(x) = \dfrac{2x-7}{x^2+5x-36}$. State the domain, asymptotes, holes, and intercepts. Show them clearly labeled on your graph. Hint: Check your previous work.

The graph of a piecewise-defined function is given. Write its definition.



$$f(x) = \begin{cases} \\ \\ \\ \end{cases}$$

Use the Binomial Theorem to expand $(3x - y)^6$. (Bonus, using Pascal's Triangle)

1

1 1

1 2 1

1 3 3 1

1 4 6 4 1

1 5 10 10 5 1

1 6 15 20 15 6 1

Sketch the graph of $h(x) = (x+5)^2 - 16$ by transforming the basic function $f(x) = x^2$.
Track the points (-1, 1), (0,0) and (1,1) in the original graph of f as you transform it into h.
Show all intercepts.

Sketch the graph of $h(x) = -2 \cdot 4^{5-x} + 6$ by transforming the basic function $f(x) = 4^x$. Track the points (-1,1/4), (0,1), and (1,4) in the original graph of f as you transform it into h. Show any intercepts and asymptotes, if any.

Sketch the graph of $h(x) = -2 \cdot \sqrt{5 - x} + 6$ by transforming the basic function $f(x) = \sqrt{x}$. Track the points (0,0), (1,1), and (4,2) in the original graph of f as you transform it into h. Show all intercepts and asymptotes, if any.

What is the domain of $\ln\left(\frac{2x-7}{x^2+5x-36}\right)$? (Hint: Solve $\frac{2x-7}{x^2+5x-36} > 0$.)

Let $f(x) = x^2 + 5$.

The difference quotient is $\frac{f(x+h) - f(x)}{h}$. Why can't you let $h = 0$?

Simplify the difference quotient.

Can you let $h = 0$ AFTER you simplify? If so, what do you obtain?

Find the sums:

$$\sum_{n=1}^{20} (1.02)^{n-1}$$

$$\sum_{n=1}^{\infty} 3\left(\frac{1}{2}\right)^{n-1}$$

Find *all* the (real *and* nonreal) zeros of $f(x) = x^5 + 5x^4 - 7x^3 - 43x^2 - 8x - 48$. Use *all* the zeros to write $f(x)$ as the product of *linear* factors. Be *very* careful with your arithmetic! You may want to find the zeros on scratch paper before showing your work on this sheet.

What is the domain of $\sqrt{\frac{x-2}{(x+3)^2(x-7)^3}}$? (Hint: Solve $\frac{x-2}{(x+3)^2(x-7)^3} \geq 0$

The half-life of radioactive Millsium is 85 years. How old is a sample of Millsium if the sample decayed from 100 grams to 12.5 grams?