

$$x = a$$

$$a^2 + 2a$$

$$a^2 - f$$

$$a^2 + 2a = a^2 - f$$

$$a = -2 \checkmark$$

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$$f(x) + b = 3$$

$$f + b = 3$$

$$b = -1 \checkmark$$

$$f(x) = \frac{x^2 + a}{2x + 1} = \frac{x^2 + 11}{2x + 1}$$

$$3 = \frac{f + a}{a}$$

$$10 = f + a$$

$$a = 11 \checkmark$$

$$f(1) = \frac{1 + 11}{2 + 1} = \frac{12}{3} = 4 \checkmark$$

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$$\frac{fx + 1}{a(x+1)(x-f)} = \frac{fx + 1}{a(x^2 + x - f)} = \frac{fx + 1}{2x^2 + ax + b} = \frac{fx + 1}{2x^2 - 9x - 1}$$

$$a = -9 \checkmark$$

$$b = -1 \checkmark$$

$$f(1) = \frac{f + 1}{2 - 9 - 1} = \frac{5}{-12} \checkmark$$

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$$\frac{x^2 - 5x}{a(x+1)^2} = \frac{x^2 - 5x}{a(x^2 + 2x + 1)} = \frac{x^2 - 5x}{-fx^2 + ax + b} = \frac{x^2 - f}{-fx^2 - 12x - f}$$

$$a = -f \checkmark$$

$$b = -f \checkmark$$

$$a + b = -12 \checkmark$$

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$$x^2 + mx + 1 = (x - 1)^2$$

$$x^2 + mx + 1 = x^2 - 2x + 1$$

$$m = -2$$

$$x^2 + mx + 1$$

$$m^2 - f < 0$$

$$(m - 2)(m + 2) < 0$$

$$\Delta = 0$$

$$1 = \frac{m}{2}$$

$$(-2, 2) \cup \{-2\} \rightarrow [-2, 2] \checkmark$$

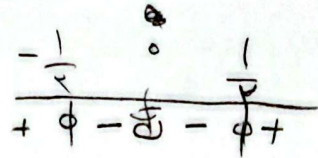
$$a < 0$$

$$\frac{-2}{+4 - 4} \quad \frac{2}{-4 - 4}$$

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$$f(x) = \sqrt{\frac{x^2-1}{x^2}}$$

$$\begin{aligned} f(x^2-1) &= 0 \\ \frac{x^2-1}{x^2} &= 0 \\ x^2-1 &= 0 \\ x^2 &= 1 \\ x &= \pm 1 \\ x &= 0 \\ x &= 0 \end{aligned}$$



$$(-\infty, -\frac{1}{\sqrt{2}}] \cup [\frac{1}{\sqrt{2}}, +\infty)$$

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$$x = x \geq 0$$

$$m=0 \quad f(x) = \sqrt{1} = 1 \checkmark$$

$$\begin{aligned} m > 0 \\ \Delta \leq 0 \\ f_m^2 - f_m \leq 0 \\ f_m(m-1) \leq 0 \\ m \in [0, 1] \end{aligned}$$

$$\rightarrow (0, 1] \cup \{0\} \rightarrow [0, 1] \checkmark$$

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$$\begin{aligned} g(\frac{1}{x}) &= f(\frac{1}{x}) \\ x(\frac{1}{x}) + 1 &= f(\frac{1}{x}) + k \\ x &= x + k \\ k &= 0 \checkmark \end{aligned}$$

$$\frac{x^2-1}{x^2-1} \quad x^2=1 \quad x = \frac{1}{x} = a \checkmark$$

$$a-k = \frac{1}{x} + 0 = \frac{1}{x} \checkmark$$

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$$f(1) = g(1)$$

$$g(x) = 3x - 2$$

$$\begin{aligned} \frac{g(1)-f}{x(1)+2} &= x(1)+b \\ \frac{a}{a} &= 1 = x + b \\ b &= -2 \checkmark \end{aligned}$$

$$\begin{aligned} g(-\frac{x}{2}) &= f(-\frac{x}{2}) \\ x(-\frac{x}{2}) - 2 &= a^2(-\frac{x}{2}) + 2 \\ -x &= -2a + 2 \\ -9 &= -2a \\ 2a &= 9 \\ a &= 3 \checkmark \end{aligned}$$

$$a-b = 3 - (-2) = 5 \checkmark$$

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$$g(x) = f(x) = x + 2 = xa^2 + 2a$$

$$\begin{aligned} xa^2 + 2a &= f \\ xa^2 + 2a - f &= 0 \\ a^2 + a - 2 &= 0 \\ (a-1)(a+2) &= 0 \\ a &= -2 \\ a &= 1 \checkmark \end{aligned}$$

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