

Written assignments
to hand in.

Section 1.7

16, 34, 40
Due Wednesday 10/11

Section 2.1

34, 38, 70
Due Friday 10/13

Section 2.2

38, 52
Due Monday 10/16

Discussion Problems
From the department syllabus
These are not to hand in.

Sections 2.1, 2.2, 2.3

WebAssign

Sections 1.7+1.8
Due Wednesday 10/11, 9pm

Sections 2.1+2.2

Due Monday 10/16, 9pm.

2.1

(25) $g(x) = \frac{1-x}{1+x}$

$$g(2) = \frac{1-2}{1+2} = -\frac{1}{3}, \quad g(-1) = \frac{1-(-1)}{1+(-1)} = \frac{2}{0} \text{ undefined, meaning } x=-1 \text{ is not in the domain of } g(x).$$

$$g\left(\frac{1}{2}\right) = \frac{1-\frac{1}{2}}{1+\frac{1}{2}} = \frac{\frac{1}{2}}{\frac{3}{2}} = \frac{1}{2} \cdot \frac{2}{3} = \frac{1}{3}$$

$$g(a) = \frac{1-a}{1+a}, \quad g(a-1) = \frac{1-(a-1)}{1+(a-1)} = \frac{2-a}{a}$$

$$g(x^2-1) = \frac{1-(x^2-1)}{1+(x^2-1)} = \frac{2-x^2}{x^2}$$

$$(31) f(x) = \begin{cases} x^2 & \text{if } x < 0 \\ x+1 & \text{if } x \geq 0 \end{cases}$$

$$\begin{aligned} f(-2) &= (-2)^2 = 4 & f(1) &= 1+1 = 2 \\ f(-1) &= (-1)^2 = 1 & f(2) &= 2+1 = 3 \\ f(0) &= 0+1 = 1 \end{aligned}$$

$$(33) f(x) = \begin{cases} x^2 + 2x & \text{if } x \leq -1 \\ x & \text{if } -1 < x \leq 1 \\ -1 & \text{if } x > 1 \end{cases}$$

$$f(-2) = (-2)^2 + 2(-2) = 0$$

$$f(-1) = (-1)^2 + 2(-1) = -1$$

$$f(0) = 0$$

$$f(1) = 1$$

$$f(2) = -1$$

$$f(3) = -1$$

$$(37) f(x) = x+4$$

$$f(x^2) = x^2 + 4$$

$$(f(x))^2 = (x+4)^2 = x^2 + 8x + 16$$

$$\begin{aligned} \frac{f(x) - f(x^2)}{2} &= \frac{x+4 - (x^2+4)}{2} \\ &= \frac{x - x^2}{2} \end{aligned}$$

$$(43) f(x) = 5 - 2x$$

Find $f(a)$, $f(a+h)$, $\frac{f(a+h) - f(a)}{h}$

$$f(a) = 5 - 2a$$

$$f(a+h) = 5 - 2(a+h)$$

$$= 5 - 2a - 2h$$

$$\frac{f(a+h) - f(a)}{h} = \frac{5 - 2a - 2h - (5 - 2a)}{h}$$

$$= \cancel{5} - \cancel{2a} - 2h - \cancel{5} + \cancel{2a}$$

$$= \frac{-2k}{k} = -2$$

(51) $f(x) = 3x$ Find the domain.
all real numbers.

More generally, if $f(x)$ is a polynomial,
then its domain is all real numbers.

(55) $f(x) = \frac{1}{x-3}$ Find the domain.

Defined as long as $x-3 \neq 0$
 $x \neq 3$.

Domain is all real numbers $x \neq 3$.

(57) $f(x) = \frac{x+2}{x^2-1}$ Find the domain.

Defined unless $x^2-1=0$
 $(x+1)(x-1)=0$
 $x=1, -1$

Domain is all real numbers $x \neq 1, -1$.

(65)

$$g(x) = \frac{\sqrt{2+x}}{3-x}$$

Defined as long as

$$3-x \neq 0$$

$$x \neq 3$$

and

$$2+x \geq 0$$

$$x \geq -2$$



$$[-2, 3) \cup (3, +\infty)$$

(86) The cost of an order of x books is

$$C(x) = \begin{cases} 10x + 15 & \text{if } x < 10 \\ 10x & \text{if } x \geq 10 \end{cases} \text{ dollars.}$$

So $C(3) = 10(3) + 15 = 45$

$$C(9) = 10(9) + 15 = 105$$

$$C(10) = 10(10) = 100$$

$$C(11) = 10(11) = 110$$

what does

The \$15 represent
in the first piece?

A shipping cost
which is waived
for orders with $x \geq 10$
books.