

1.10

$$-5 \in \mathbb{Z}$$

$$-5 \notin \mathbb{N}$$

$$\frac{2}{3} \notin \mathbb{Z}$$

$$\frac{2}{3} \in \mathbb{Q}$$

$$\sqrt{5} \in \mathbb{R}$$

$$\sqrt{5} \notin \mathbb{Q}$$

1.11

$$2 \in \{1, 2, 3, 4\}$$

$$3 \notin \{0, 1, 2, 4\}$$

$$1, 5 \notin \{1, 2, 3, 4\}$$

$$-1 \notin \{-2, 1, 0, 1\}$$

1.12

$$\{0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20\}$$

$$\{21, 23, 25, 27, 29, 31, 33, 35\}$$

$$\{2, 3, 5, 7, 11, 13, 17, 19, 23, 29\}$$

1.13

$$\{1, 2, 3, 4\} \setminus \{4\} = \{1, 2, 3\}$$

$$\{1, 2, 3, 4\} \setminus \{2, 4\} = \{1, 3\}$$

$$\{1, 2, 3, 4\} \setminus \{1, 5\} = \{2, 3, 4\}$$

$$\mathbb{Z} \setminus \mathbb{N} = \{\dots, -4, -3, -2, -1, 0\}$$

1.14**a)**

$$\begin{aligned}4 * 2^2 &= 4 * 4 \\ &= 16\end{aligned}$$

b)

$$\begin{aligned}4 * (-2)^2 &= 4 * 4 \\ &= 16\end{aligned}$$

c)

$$\begin{aligned}5 - 3^2 &= 5 - 9 \\ &= -4\end{aligned}$$

d)

$$\begin{aligned}(5 - 3)^2 &= 2^2 \\ &= 4\end{aligned}$$

e)

$$\begin{aligned}-2^2 + 3^2 - 2 * (-2) &= -4 + 9 + 4 \\ &= 9\end{aligned}$$

f)

$$\begin{aligned}-(-2)^2 + (-3)^2 - 2^2 &= -(4) + 9 - 4 \\ &= 1\end{aligned}$$

g)

$$\begin{aligned}(-3)^2 + 5 * (-3) + 6 &= 9 - 15 + 6 \\ &= -5 + 6 \\ &= 0\end{aligned}$$

Oppgave 1.15**a)**

$$\begin{aligned}2(7 - 5) + 2 &= 2 * 2 + 2 \\ &= 4 + 2 = 6\end{aligned}$$

b)

$$\begin{aligned} -3(4-12) + 2 * 3^2 &= -3 * -8 + 2 * 9 \\ &= 24 + 18 = 42 \end{aligned}$$

c)

$$\begin{aligned} -(8-4) - (3)^2 &= -4 - 9 \\ &= -13 \end{aligned}$$

d)

$$\begin{aligned} -2^4 + 3(17-3^2) + (3 * 4^2 - 2 * 5^2) &= -2^4 + 3 * 8 + (3 * 4^2 - 2 * 5^2) \\ &= -2^4 + 3(17-3^2) - 2 \\ &= -16 + 24 - 2 \\ &= 8 - 2 \\ &= 6 \end{aligned}$$

Oppgave 1.16

a)

$$\begin{aligned} 2(2 * 2 - 2)^2 &= 2(4 - 2)^2 \\ &= 2 * 4 \\ &= 8 \end{aligned}$$

b)

$$-2^6 + (-2)^6 = -64 + 64 = 0$$

c)

$$\begin{aligned} 4(3-2)^3 - 3(2-3)^3 &= 4 * 1 - 3 * (-1) \\ &= 4 + 3 \\ &= 7 \end{aligned}$$

d)

$$\begin{aligned} 4(2^2-3)^5 - 3(2^3-3^2)^5 &= 4 * 1^5 - 3 * (-1)^5 \\ &= 4 * 1 - 3 * -1 \\ &= 4 - (-3) \\ &= 4 + 3 \\ &= 7 \end{aligned}$$

Oppgave 1.17

a)

$$\begin{aligned}2(2 * 2 - 2)^2 &= 2(4 - 2)^2 \\&= 2 * 4 \\&= 8\end{aligned}$$

b)

$$-2^6 + (-2)^6 = -64 + 64 = 0$$

c)

$$\begin{aligned}4(3 - 2)^3 - 3(2 - 3)^3 &= 4 * 1 - 3 * (-1) \\&= 4 + 3 \\&= 7\end{aligned}$$

d)

$$\begin{aligned}4(2^2 - 3)^5 - 3(2^3 - 3^2)^5 &= 4 * 1^5 - 3 * (-1)^5 \\&= 4 * 1 - 3 * -1 \\&= 4 - (-3) \\&= 4 + 3 \\&= 7\end{aligned}$$

exmaples

$$\begin{aligned}3 * \frac{2}{3} &= \frac{3}{1} * \frac{3}{3} - \frac{2}{3} \\&= \frac{7}{3} = \frac{3 + 3 + 1}{3} \\&= \frac{3}{3} + \frac{3}{3} + \frac{1}{3} \\&= 1 + 1 + \frac{1}{3} = 2\frac{1}{3}\end{aligned}$$

1.22

$$\frac{1}{12} + \frac{4}{9}$$

$$\frac{1}{12} * \frac{4}{9}$$

$$3 + \frac{5}{12}$$

$$3 * \frac{5}{12}$$

$$3 * \frac{5}{12}$$

1.23

$$2 * (\frac{3}{8} + \frac{1}{4})$$

$$2 * (\frac{5}{6} + \frac{2}{9}) * \frac{3}{5}$$

$$(\frac{5}{36} + \frac{1}{12}) * \frac{2}{9}$$

$$(\frac{7}{6} + \frac{2}{9}) * (\frac{1}{5} + \frac{1}{4})$$

1.24

$$\frac{\frac{2}{3}}{\frac{5}{6}} = \frac{\frac{2}{3} * \frac{6}{1}}{\frac{5}{6} * \frac{6}{1}}$$

$$\frac{\frac{21}{36}}{\frac{14}{45}}$$

$$\frac{\frac{3}{2} + \frac{5}{8}}{\frac{1}{4} + \frac{25}{2}}$$

$$\frac{3 + \frac{4}{3}}{\frac{5}{12} + 5}$$