

This problem set is not homework. Students can use this problem set as extra practice or study guide for quizzes.

- Label each of the following statements as true or false.
  - 3 is odd and the set of all natural numbers is closed under addition.
  - 12 is even and  $-7$  is a natural number.
  - 5 is greater than 7 or 5 is equal to 7. (We write this as  $5 \geq 7$  read: 5 is greater than or equal to 7)
  - 8 is less than 8 or 8 is equal to 8. (We write this as  $8 \leq 8$  read: 8 is less than or equal to 8)
- List all natural numbers  $x$  with the given property.
  - $x < 6$
  - $x < 7$  and  $x > 3$
  - $x < 7$  or  $x > 3$
  - $x \leq 10$  and  $x$  is even
- Simplify each of the following expressions by applying the order of operations agreement. **Show all steps. For each step, write a separate line!**

a)  $8 - 2 + 3$

g)  $32 - 3(28 - 2^2(20 - 5 \cdot 3))$

b)  $\frac{15 - 2^3 + 3}{3^2 - 2^3}$

h)  $\left(\left(\left(10 - 8\right)^2 - 1\right)^2 - 2\right)^2$

c)  $120 \div (4 + 3(5 \cdot 2^2 - 2(5 + 2^2)))$

i)  $1^2 + 1^3 - 1^4 + 1^5$

d)  $\frac{3^2 - 2^2}{(3 - 2)^2}$

j)  $2^2 + 2^3$

e)  $\left(3 - (10 - 3^2)^2\right)^2$

k)  $2^5 - 3(12 - 3^2)^2$

f)  $\frac{100 \div 5 \cdot 2}{25 - 10 + 5}$

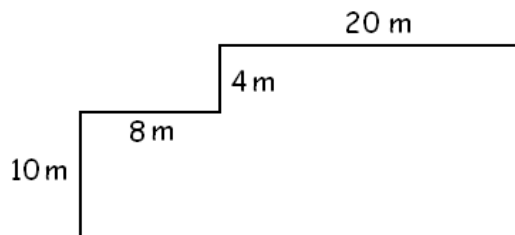
l)  $5 \cdot 2^3 - (10 - (7 - 2 \cdot 3 + 1) \div 2 + 2^2)$

m)  $\left(2 - \left(2 - (10 - 3^2)^2\right)^2\right)^2$

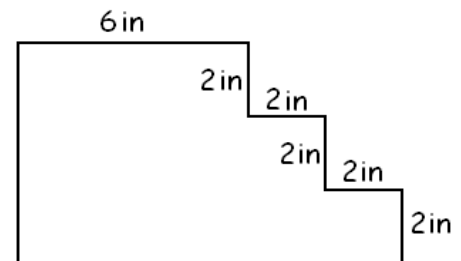
- Insert parentheses in the expression on the left-hand side to make the equation true.

$$36 - 2 \cdot 5 - 2^2 + 4 = 10$$

- Compute the perimeter and area of each of the objects shown. Angles that look like right angles are right angles. Include units in your computation and answer.



a)



b)

## Answers

1. a) true b) false c) false d) true

2. a) 1, 2, 3, 4, 5 b) 4, 5, 6 c) all natural numbers d) 2, 4, 6, 8, 10

3. a) 9 b) 10 c) 12 d) 5 e) 4 f) 2 g) 8 h) 49 i) 2 j) 12 k) 5 l) 27 m) 1

4.  $36 - 2 \cdot ((5 - 2)^2 + 4) = 10$

5. a)  $P = 84 \text{ m}$ ,  $A = 360 \text{ m}^2$  b)  $P = 32 \text{ in}$ ,  $A = 48 \text{ in}^2$