Samples Range and domain SOLUTIONS

1. $f(z)=\sqrt{4\,(-3+z)}$
When determining the domain of this function, we need to keep in mind the following:

- we can only take the square root of positive numbers or 0, so $4\,(-3+z)\geq 0$;
- so $z\geq 3$.

Hence, the domain of this function is $[3,\infty)$, i.e. $z\geq 3$.

When evaluating the range, we need to keep in mind the following (starting with variable z):

- square root is always positive or 0, so $\sqrt{4\,(-3+z)}\geq 0$.

Hence, the range of this function is $[0,\infty)$.

2. $f(x)=-9\sqrt{-4+x}$
When determining the domain of this function, we need to keep in mind the following:

- we can only take the square root of positive numbers or 0, so $-4+x\geq 0$;
- so $x\geq 4$.

Hence, the domain of this function is $[4,\infty)$, i.e. $x\geq 4$.

When evaluating the range, we need to keep in mind the following (starting with variable x):

- square root is always positive or 0, so $\sqrt{-4+x}\geq 0$;
- multiplying by a negative number usually reverses the inequality , so $-9\sqrt{-4+x}\leq 0$.

Hence, the range of this function is $(-\infty,0]$.

3. $f(z)=\left|\frac{-6}{\sqrt{z}}\right|$
When determining the domain of this function, we need to keep in mind the following:

- we can find the absolute value of any number;
- denominator of a fraction cannot be 0, so $\sqrt{z}\neq 0$;
- we can only take the square root of positive numbers or 0, so $z>0$.

Hence, the domain of this function is $(0,\infty)$, i.e. $z>0$.

When evaluating the range, we need to keep in mind the following (starting with variable z):

- square root is always positive or 0, so $\sqrt{z}\geq 0$;
- negative numerator usually reverse the inequality, and also this fraction can't be 0, so $\frac{-6}{\sqrt{z}}<0$;
- absolute value is always positive or 0, so $\left|\frac{-6}{\sqrt{z}}\right|>0$.

Hence, the range of this function is $(0,\infty)$.