



Name: _____



Find the output of these function machines:

- a) $8 \rightarrow \text{Subtract 6} \rightarrow 2$
 b) $4 \rightarrow \text{Times by 5} \rightarrow 20$
 c) $7 \rightarrow \text{Add 14} \rightarrow 21$
 a) $8 \rightarrow \text{Subtract 12} \rightarrow -4$
 b) $4 \rightarrow \text{Times by -3} \rightarrow -12$
 c) $7 \rightarrow \text{Add -12} \rightarrow -5$

- d) $2 \rightarrow \text{Times by -5} \rightarrow -10$
 e) $-4 \rightarrow \text{Add 8} \rightarrow 4$
 f) $10 \rightarrow \text{Subtract 14} \rightarrow -4$
 d) $-8 \rightarrow \text{Divide by 4} \rightarrow -2$
 e) $-3 \rightarrow \text{Times by 5} \rightarrow -15$
 f) $-2 \rightarrow \text{Subtract 8} \rightarrow -10$

Find the input of these function machines:

- g) $2 \rightarrow \text{Add 3} \rightarrow 5$
 h) $9 \rightarrow \text{Subtract 5} \rightarrow 14$
 i) $3 \rightarrow \text{Times by 5} \rightarrow 15$
 g) $-7 \rightarrow \text{Add 12} \rightarrow 5$
 h) $29 \rightarrow \text{Subtract 15} \rightarrow 14$
 i) $4 \rightarrow \text{Squared} \rightarrow 16$

- j) $5 \rightarrow \text{Times by 6} \rightarrow 30$
 k) $-32 \rightarrow \text{Divide by 4} \rightarrow -8$
 l) $-3 \rightarrow \text{Times by -4} \rightarrow 12$
 j) $-6 \rightarrow \text{Times by -5} \rightarrow 30$
 k) $-24 \rightarrow \text{Divide by 4} \rightarrow -6$
 l) $0.5 \rightarrow \text{Times by -2} \rightarrow -1$

Find the rules of these function machines:

- m) $\begin{matrix} 8 \\ 12 \end{matrix} \rightarrow \text{Subtract 3} \rightarrow \begin{matrix} 5 \\ 9 \end{matrix}$
 n) $\begin{matrix} 2 \\ 5 \end{matrix} \rightarrow \text{Times by 4} \rightarrow \begin{matrix} 8 \\ 20 \end{matrix}$
 m) $\begin{matrix} 5 \\ 6 \end{matrix} \rightarrow \text{Add 1} \rightarrow \begin{matrix} 6 \\ 7 \end{matrix}$
 n) $\begin{matrix} -2 \\ 2 \end{matrix} \rightarrow \text{Times by -1} \rightarrow \begin{matrix} 2 \\ -2 \end{matrix}$
 o) $\begin{matrix} -2 \\ 5 \end{matrix} \rightarrow \text{Add 5} \rightarrow \begin{matrix} 3 \\ 10 \end{matrix}$

- p) $\begin{matrix} 12 \\ 16 \end{matrix} \rightarrow \text{Minus 6} \rightarrow \begin{matrix} 6 \\ 10 \end{matrix}$
 q) $\begin{matrix} 7 \\ 28 \end{matrix} \rightarrow \text{Divide by 7} \rightarrow \begin{matrix} 1 \\ 4 \end{matrix}$
 r) $\begin{matrix} 16 \\ 2 \end{matrix} \rightarrow \text{Divide by 2} \rightarrow \begin{matrix} 8 \\ 1 \end{matrix}$
 s) $\begin{matrix} 3 \\ 5 \end{matrix} \rightarrow \text{Square} \rightarrow \begin{matrix} 9 \\ 25 \end{matrix}$
 t) $\begin{matrix} -4 \\ 1 \end{matrix} \rightarrow \text{Times by -8} \rightarrow \begin{matrix} 32 \\ -8 \end{matrix}$

Exam question:

Here is a function machine. The input is shown.

$$3y \rightarrow \boxed{+ 2} \rightarrow$$

a) Write an expression for its output.

a) $3y + 2$

b) Find the value of the output if $y = -2$

b) $3(-2) + 2 = -4$

