Step 3: Solve for y:

$$x + 7 = 8y^3$$

$$\frac{x+7}{8} = y^3$$

$$\sqrt[3]{\frac{x+7}{8}} = y \qquad (\text{take cube root})$$

So, $y = \sqrt[3]{\frac{x+7}{8}}$

Step 4: Replace y by $f^{-1}(x)$

$$\boxed{f^{-1}(x) = \sqrt[3]{\frac{x+7}{8}}}$$

Choice : A

(12) Pick one function, find the inverse to see whether one of the remaining two would be its inverse.

Say, we pick $g(x) = 2x - 3$.

Step 1: Replace $g(x)$ by y : $y = 2x - 3$

Step 2: Swap x and y : $x = 2y - 3$

Step 3: Solve for y : $x + 3 = 2y$

$$\frac{x+3}{2} = y$$

Step 4: Replace y by $g^{-1}(x)$:

$$g^{-1}(x) = \frac{x+3}{2}$$

This matches with the formula of $h(x)$

So, $g(x)$ and $h(x)$ are inverses of one

another.

Choice : C.

Short Answer.

(13) $y = x^3$ $\xrightarrow[\substack{\text{Replace x by} \\ x - 5.3}]{\text{5.3 to the right}}$ $y = (x - 5.3)^3$

Vertically shrunk
by 0.6
(multiply by 0.6
outside

$$y = 0.6(x - 5.3)^3$$

(14) $g(x) = \frac{1}{8} f(x) \longrightarrow$ Vertical Shrink by a factor of $\frac{1}{8}$

$(-8, 32) \xrightarrow{\text{Vertical Shrink by } \frac{1}{8}} (-8, 4)$

Multiply y-coord by $\frac{1}{8}$. $\longrightarrow$ $32 \cdot \frac{1}{8} = 4$

Answer: $\boxed{(-8, 4)}$

(15)

$\dfrac{x}{\sqrt{x - 10}} \longrightarrow$ Square root in denominator

To find domain: Set $x - 10 > 0$

$x > 10$

Answer: $\boxed{(10, \infty)}$

(16) $f(x) = -4x - 8; \quad g(x) = 4x^2 - 8x + 8$

Find $(f \circ g)(-3)$

$(f \circ g)(-3) = f(g(-3))$

Plug -3 into g and then plug result into f

Plug -3 into g: $g(-3) = 4 \cdot (-3)^2 - 8 \cdot (-3) + 8$

$= 4 \cdot 9 + 24 + 8$

$= 68$

Then plug 68 into f:

$f(68) = -4(68) - 8 = \boxed{-280}$

Essay.

(17) $f(x) = 4x^2 + 3x + 5; \quad g(x) = 3x - 3.$

Find $(g \circ f)(x)$

$(g \circ f)(x) = g(f(x)) \rightarrow$ plug $f(x)$ into g.

$$g(f(x)) = 3(4x^2 + 3x + 5) - 3$$

$$\underbrace{4x^2 + 3x + 5}_{f(x)}$$

$$= 12x^2 + 9x + 15 - 3 \quad \text{(Distribute)}$$

$$= \boxed{12x^2 + 9x + 12} \quad \text{(Combine like terms)}$$

(18) $f(x) = \dfrac{5x+1}{6}$ Find inverse.

Step 1: Replace $f(x)$ by y.

$$y = \frac{5x+1}{6}$$

Step 2: Swap x and y

$$x = \frac{5y+1}{6}$$

Step 3: Solve for y.

$$6x = 5y + 1 \quad \text{(Multiply both sides by 6)}$$

$$6x - 1 = 5y \rightarrow \frac{6x-1}{5} = y$$

So, $y = \dfrac{6x-1}{5}$.

Step 4: Replace y by $f^{-1}(x)$

$$f^{-1}(x) = \frac{6x - 1}{5}$$