Answers to Worksheet 22 - Average Rate, Value, Derivative of Inverse

1)
$$(f^{-1})'(a) = 6$$

2)
$$(f^{-1})'(a) = -\frac{1}{5}$$

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 3) $(f^{-1})'(a) = -\frac{1}{12}$ 4) $(f^{-1})'(a) = \frac{1}{8}$

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$$(f^{-1})'(a) = \frac{1}{8}$$

5)
$$f'(t) = \frac{1}{\sqrt{1 - (2t^4)^2}} \cdot 8t^3$$

= $\frac{8t^3}{\sqrt{1 - 4t^8}}$

$$= \frac{1}{\sqrt{1 - (2t^4)^2}} \cdot 8t^3 \qquad 6) \frac{dr}{dx} = -\frac{1}{\sqrt{1 - (3x^5)^2}} \cdot 15x^4 \qquad 7) h'(w) = \frac{1}{(-w^3)^2 + 1}$$

$$= \frac{8t^3}{\sqrt{1 - 4t^8}} \qquad = -\frac{15x^4}{\sqrt{1 - 9x^{10}}} \qquad = -\frac{3w^2}{w^6 + 1}$$

$$= \frac{1}{\sqrt{1 - 9x^{10}}} \cdot 20x^3 \qquad 9) h'(1) = -8 \qquad 10) \frac{2}{\sqrt{1 - 9x^{10}}}$$

5)
$$f'(t) = \frac{1}{\sqrt{1 - (2t^4)^2}} \cdot 8t^3$$
 6) $\frac{dr}{dx} = -\frac{1}{\sqrt{1 - (3x^5)^2}} \cdot 15x^4$ 7) $h'(w) = \frac{1}{(-w^3)^2 + 1} \cdot -3w^2$

$$= \frac{8t^3}{\sqrt{1 - 4t^8}} = -\frac{15x^4}{\sqrt{1 - 9x^{10}}} = -\frac{3w^2}{w^6 + 1}$$

8)
$$h'(x) = \frac{1}{\sqrt{1 - (-5x^4)^2}} \cdot -20x^3$$

= $-\frac{20x^3}{\sqrt{1 - 25x^8}}$

10)
$$-\frac{2}{3}$$

11) -1

- 12) Average rate of change: 1 Average value: $-\frac{2}{3}$
- 13) Average rate of change: $-\frac{1}{2}$ Average value: ln 2

- 14) Average rate of change: 1 Average value: $-\frac{1}{3}$
- 15) Average rate of change: $\frac{1}{2}$ Average value: -ln 2