

Differentiability

WU after 3.1 and 3.2

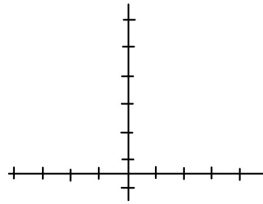
1. Graph $g(x)$.

Determine the domain.

Determine where $g(x)$ is continuous.

Determine where $g(x)$ is differentiable.

$$g(x) = \begin{cases} 4 & x \leq -2 \\ x^2 & -2 < x < 2 \\ 2x & x \geq 2 \end{cases}$$



Domain:

Continuous:

Differentiable:

Find $\frac{dy}{dx}$.

2. $y = 5x^3 - x^\pi + 4$

3. $y = \frac{3}{\sqrt{x}}$

4. Write the equation of the tangent for $f(x) = x^2 - 4$ @ $x = 3$.

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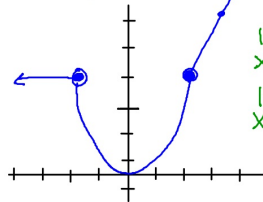
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Domain: $(-\infty, \infty)$

Continuous: $(-\infty, \infty)$

Differentiable: $(-\infty, -2) \cup (-2, 2) \cup (2, \infty)$

Find $\frac{dy}{dx}$.

2. $y = 5x^3 - x^\pi + 4$

$y' = 15x^2 - \pi x^{\pi-1}$

3. $y = \frac{3}{\sqrt{x}}$ $y = 3x^{-1/2}$
 $y' = -\frac{3}{2} x^{-3/2}$

4. Write the equation of the tangent for $f(x) = x^2 - 4$ @ $x = 3$.

pt:	Slope
$(3, f(3))$	$f'(x) = 2x$
$f(3) = (3)^2 - 4 = 5$	$f'(3) = 2 \cdot 3 = 6$
$(3, 5)$	$y - 5 = 6(x - 3)$