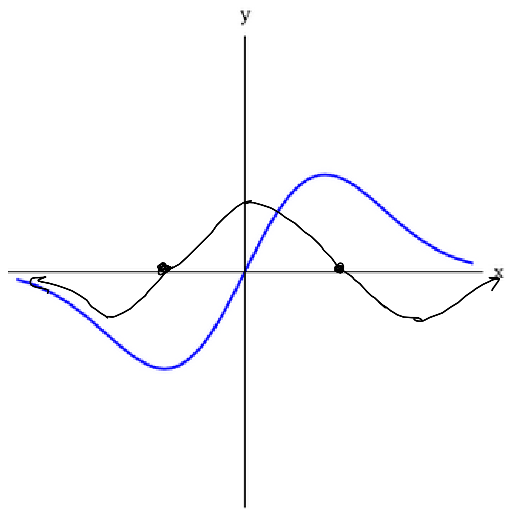
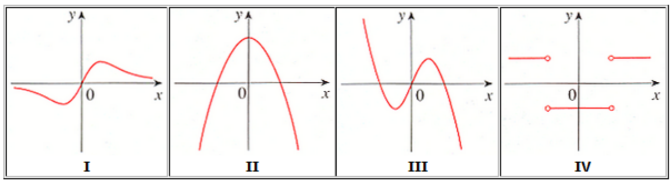
1. Question Details SCalc8 2.2.001. [3354424]

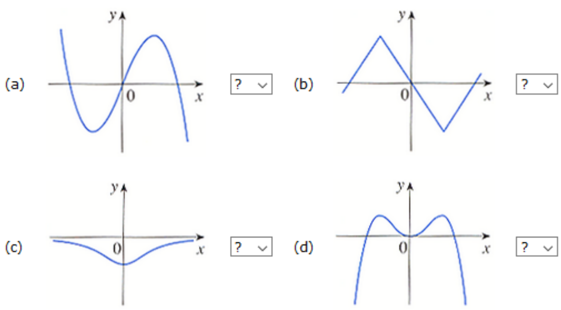
Use the given graph of $f(x)$ to sketch the graph of f'.



2. Question Details SCalc8 2.2.003.MI. [3354543]

The graphs of four derivatives are given below. Match the graph of each function in (a)-(d) with the graph of its derivative in I-IV.

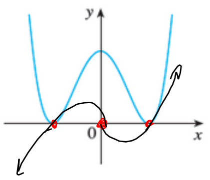




I c
II a
III d
IV b

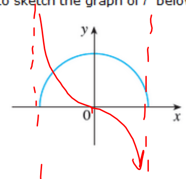
3. Question Details SCalc8 2.2.004. [3394380]

Trace or copy the graph of the given function f. (Assume that the axes have equal scales.) Then use the method of the example to sketch the graph of f' below it.



4. Question Details SCalc8 2.2.007. [3394369]

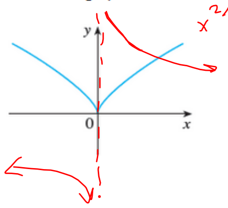
Trace or copy the graph of the given function f. (Assume that the axes have equal scales.) Then use the method of the example to sketch the graph of f' below it.



5. Question Details SCalc8 2.2.008. [3394363]

Trace or copy the graph of the given function f. (Assume that the axes have equal scales.) Then use the method of the example to sketch the graph of f' below it.

$x^{2/3}$ shape



6. Question Details SCalc8 2.2.020. [3354470]

Find the derivative of the function using the definition of derivative.

$f(x) = px + s$

$f'(x) =$ ☐

$$\frac{f(x+h)-f(x)}{h} = \frac{p(x+h)+s-(px+s)}{h}$$

$$= \frac{px+ph+s-px-s}{h} = \frac{ph}{h} = p \xrightarrow{h\to 0} p \quad (h \neq 0)$$

State the domain of the function. (Enter your answer using interval notation.)

State the domain of its derivative. (Enter your answer using interval notation.)

$$\frac{d}{dx}\left[px^1 + s\right] = 1px^{1-1} + 0 = p$$

$$\mathcal{D}(f) = \mathcal{D}(f') = \mathbb{R} = (-\infty, \infty)$$

7. Question Details SCalc8 2.2.025. [3354346]

Find the derivative of the function using the definition of derivative.

$g(x) = \sqrt{6-x} = (6-x)^{\frac{1}{2}} \implies \frac{1}{2}(6-x)^{-\frac{1}{2}}(-1) = \frac{-1}{2\sqrt{6-x}}$

State the domain of the function. (Enter your answer using interval notation.)

State the domain of its derivative. (Enter your answer using interval notation.)

$\mathcal{D}(g) = \{x \mid x \le 6\} = (-\infty, 6]$

$6 - x \ge 0$

$6 \ge x$

$\mathcal{D}(g') = (-\infty, 6)$

$$\frac{g(x+h)-g(x)}{h} = \left(\frac{\sqrt{6-(x+h)} - \sqrt{6-x}}{h}\right)\left(\frac{\sqrt{6-(x+h)} + \sqrt{6-x}}{\sqrt{6-(x+h)} + \sqrt{6-x}}\right)$$

$$= \frac{6-(x+h) - (6-x)}{h\left(\sqrt{6-(x+h)} + \sqrt{6-x}\right)} = \frac{6-x-h-6+x}{h(\quad)} = \frac{-h}{h(\quad)}$$

$$= \frac{-1}{\sqrt{6-(x+h)} + \sqrt{6-x}} \xrightarrow{h\to 0} \frac{-1}{\sqrt{6-x}+\sqrt{6-x}} = \frac{-1}{2\sqrt{6-x}}$$

8. Question Details SCalc8 2.2.027. [3354537]

Find the derivative of the function using the definition of derivative.

$$G(t) = \frac{1 - 3t}{5 + t}$$

State the domain of the function. (Enter your answer using interval notation.)

State the domain of its derivative. (Enter your answer using interval notation.)

Quotient Rule: $\left(\frac{f}{g}\right)' = \frac{f'g - fg'}{g^2}$

$$= \frac{-3(t+5) - (1-3t)(1)}{(t+5)^2} = \frac{-3t - 15 - 1 + 3t}{(\,)^2} = \boxed{\frac{-16}{(t+5)^2}}$$

STOP HERE ON TEST!

$$\boxed{\mathcal{D}(G) = \mathbb{R} \setminus \{-5\} = \mathcal{D}(G') \quad (-\infty, -5) \cup (-5, \infty)}$$

$$\frac{G(t+h) - G(t)}{h}$$

LCD $= (t+5)(t+h+5)$

$$\frac{1}{h}\left[\frac{1-3(t+h)}{(t+h)+5} - \frac{1-3t}{t+5}\right] = \left[\frac{(1-3t-3h)(t+5) - (1-3t)(t+h+5)}{(t+5)(t+h+5)}\right]\frac{1}{h}$$

$$= \frac{1}{h}\left[\frac{t + 5 - 3t^2 - 15t - 3ht - 15h - [t + h + 5 - 3t^2 - 3ht - 15t]}{\text{LCD}}\right] = \frac{1}{h}\Big[$$

$$= \frac{1}{h}\left[\frac{t + 5 - 3t^2 - 15t - \cancel{3ht} - 15h - t - h - 5 + 3t^2 + \cancel{3ht} + 15t}{\text{LCD}}\right] = \frac{-16h}{h(\text{LCD})}$$

$$= \frac{-16}{(t+5+h)(t+5)} \xrightarrow{h \to 0} \boxed{\frac{-16}{(t+5)^2}}$$

9. Question Details SCalc8 2.2.029. [3354578]

Find the derivative of the function using the definition of derivative.

$$f(x) = 6x^4$$

State the domain of the function. (Enter your answer using interval notation.)

State the domain of its derivative. (Enter your answer using interval notation.)

Sep 19-10:01 AM

10. Question Details SCalc8 2.2.035. [3354415]

The table gives the height as time passes of a typical pine tree grown for lumber at a managed site.

Tree age (years)	14	21	28	35	42	49
Height (feet)	41	54	65	73	78	83

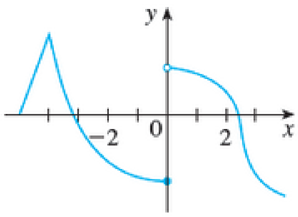
If $H(t)$ is the height of the tree after t years, construct a table of estimated values for H'. (Use a one-sided difference quotient with an adjacent point for the first and last values, and the average of two difference quotients with adjacent points for all other values. Round your answers to two decimal places.)

t	$H'(t)$
14	
21	
28	
35	
42	
49	

Sketch the graph of H'.

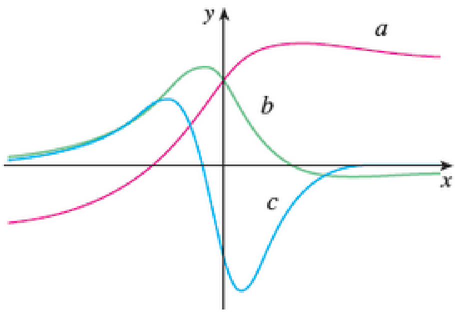
11. Question Details SCalc8 2.2.039. [3354298]

The graph of *f* is given. State the numbers at which *f* is *not* differentiable.



12. Question Details SCalc8 2.2.047. [3354150]

The figure shows the graphs of f, f', and f''. Identify each curve.



13. Question Details SCalc8 2.2.055.MI. [3354533]

If $f(t) = \sqrt[3]{t}$ and $a \neq 0$, find $f'(a)$.

14. Question Details SCalc8 2.2.059. [3354095]

(a) Sketch the graph of the function $f(x) = x|x|$.

(b) For what values of x is f differentiable?

(c) Find a formula for f' where it is defined.

15. Question Details SCalc8 2.2.065. [3354487]

Let ℓ be the tangent line to the curve $y = 2x^2$ at the point $(1, 2)$. The *angle of inclination* of ℓ is the angle ϕ that ℓ makes with the positive direction of the x-axis. Calculate ϕ correct to the nearest degree.

16. Question Details SCalc8 2.2.505.XP. [3390027]

If $f(x) = x^2 - \sqrt{x} + 5$, find $f'(x)$.

17. Question Details SCalc8 2.2.JIT.001. [3390033]

Evaluate the function at the indicated values. (If an answer is undefined, enter UNDEFINED.)

$f(x) = x^2 + 7x$

$f(0) =$ ____

$f(3) =$ ____

$f(-3) =$ ____

$f(a) =$ ____

$f(-x) =$ ____

$f\left(\frac{1}{a}\right) =$ ____