

تم تحميل هذا الملف من موقع المناهج الإماراتية



أوراق عمل نهاية الفصل الوحدة الثالثة Differentiation التفاضل وفق الهيكل الوزاري

موقع المناهج ← المناهج الإماراتية ← الصف الثاني عشر المتقدم ← رياضيات ← الفصل الأول ← أوراق عمل ← الملف

تاريخ إضافة الملف على موقع المناهج: 2024-10-31 13:26:25

ملفات اكتب للمعلم اكتب للطالب | اختبارات الكترونية | اختبارات | حلول | عروض بوربوينت | أوراق عمل
منهج انجليزي | ملخصات وتقارير | مذكرات وبنوك | الامتحان النهائي للمدرس

المزيد من مادة
رياضيات:

إعداد: ismail islam

التواصل الاجتماعي بحسب الصف الثاني عشر المتقدم



الرياضيات



اللغة الانجليزية



اللغة العربية



التربية الاسلامية



المواد على تلغرام

صفحة المناهج
الإماراتية على
فيسبوك

المزيد من الملفات بحسب الصف الثاني عشر المتقدم والمادة رياضيات في الفصل الأول

الهيكل الوزاري الجديد المسار النخبة

1

الهيكل الوزاري الجديد المسار المتقدم

2

أسئلة الامتحان النهائي القسم الورقي - الكتابي

3

أوراق عمل مراجعة الوحدة الثانية Continuity and Limit النهاية والاتصال

4

**EOT Math 12 Advanced
2024-2025-Term1**



The only way to learn mathematics is to do mathematics.

Wishing you all the best 😊



My Name :

Section:



Ms. Islam Ismail Abu Mesameh

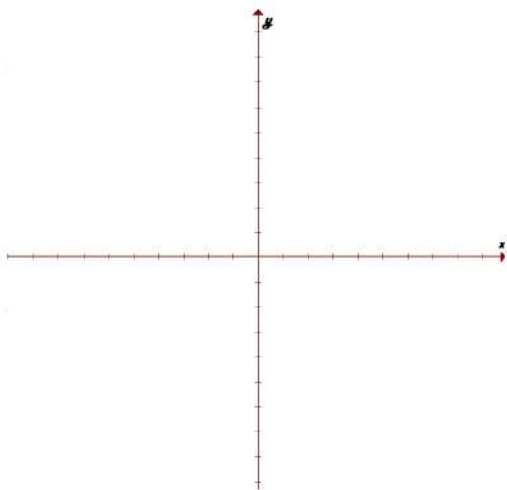
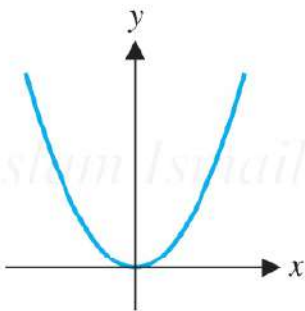


6	Sketch the graph of a function using the graph of its derivative.	(13 – 18)	Page 151
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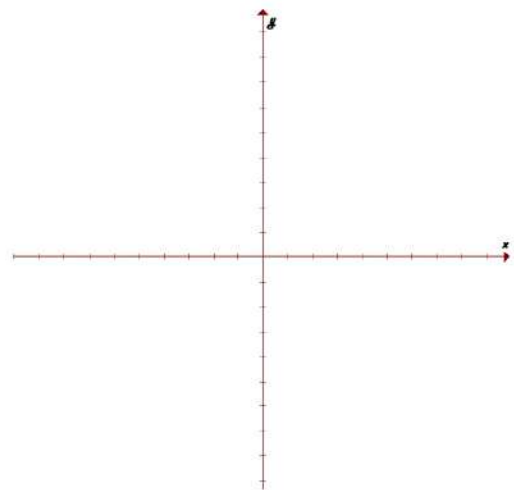
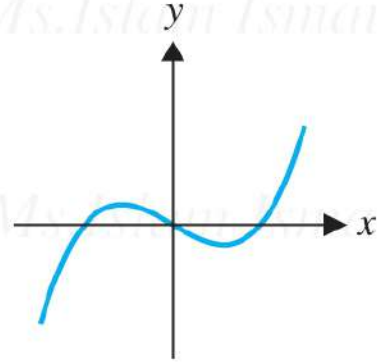
Graphs of Functions and Their Derivatives

Exercises Page 151: Use the graph of f to sketch a graph of f' .

Q13) (a)



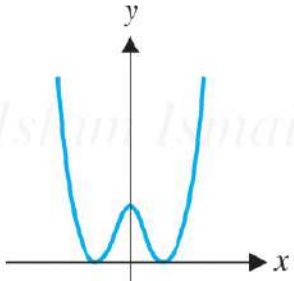
Q13) (b)



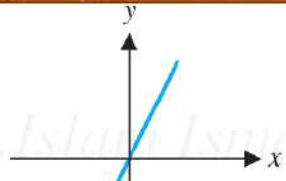
12 Advanced Math Worksheets
Unit 3 : Differentiantion

Ms.Islam Ismail

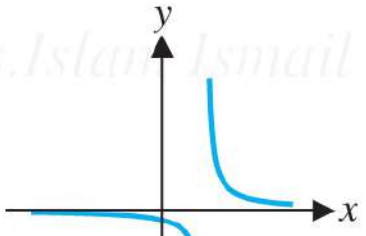
Q14) (a)



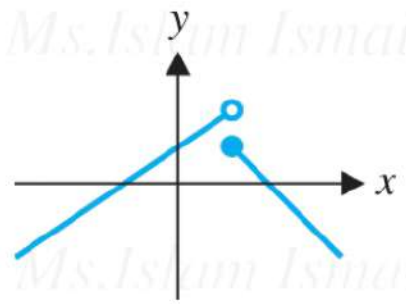
Q14) (b)



Q16) (a)



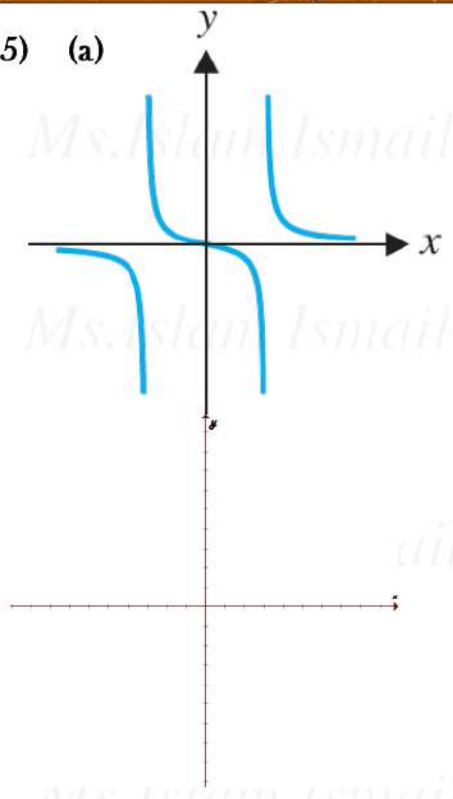
Q16) (b)



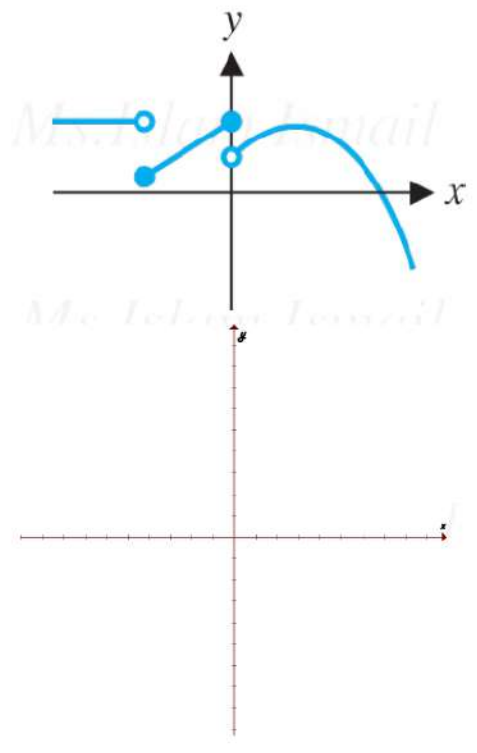
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Q15) (a)

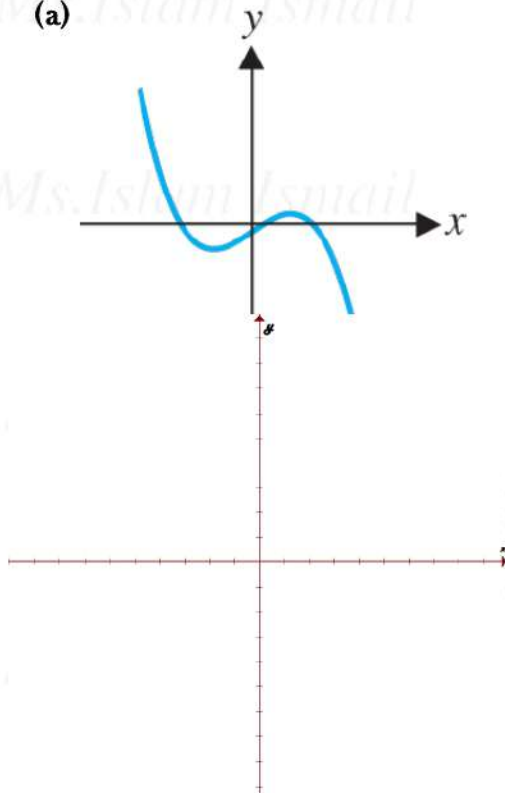


Q15) (b)

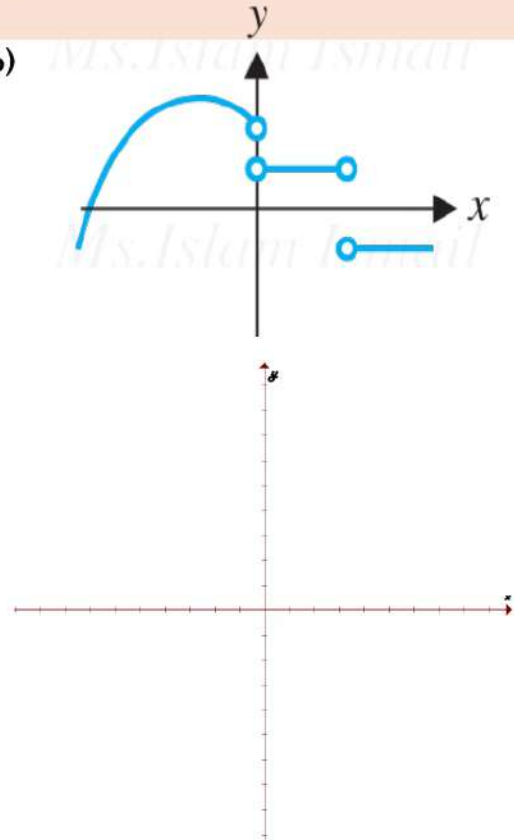


Use the given graph of f' to sketch a plausible graph of a continuous function f .

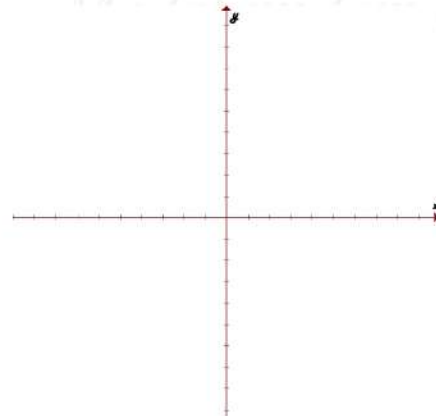
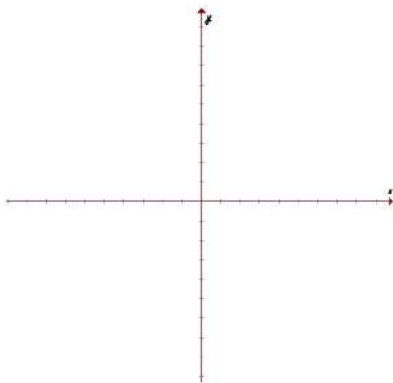
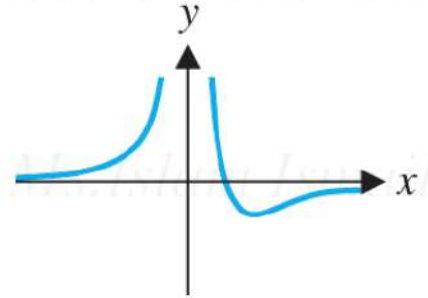
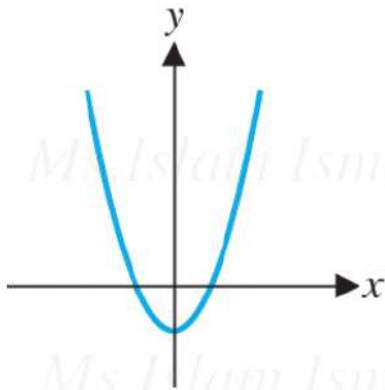
Q17) (a)



Q17) (b)



Use the given graph of f' to sketch a plausible graph of a continuous function f .



7	Understand the Mean Value Theorem and use it in applications.	(19 – 22)	Page 151
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Exercise page 151:

Compute the right-hand derivative and the left-hand derivative Does $f'(0)$ exist?

$$\text{Q19) } f(x) = \begin{cases} 2x + 1 & \text{if } x < 0 \\ 3x + 1 & \text{if } x \geq 0 \end{cases}$$

$$\text{Q20) } f(x) = \begin{cases} 0 & \text{if } x < 0 \\ 2x & \text{if } x \geq 0 \end{cases}$$

$$\text{Q22) } f(x) = \begin{cases} 2x & \text{if } x < 0 \\ x^2 + 2x & \text{if } x \geq 0 \end{cases}$$



$$Q21) f(x) = \begin{cases} x^2 & \text{if } x < 0 \\ x^3 & \text{if } x \geq 0 \end{cases}$$

Which of the following $f'(0)$ exist

$$A) f(x) = \begin{cases} x^2 & \text{if } x < 0 \\ x^3 & \text{if } x \geq 0 \end{cases}$$

$$B) f(x) = \begin{cases} 0 & \text{if } x < 0 \\ 2x & \text{if } x \geq 0 \end{cases}$$

$$C) f(x) = \begin{cases} 2x + 1 & \text{if } x < 0 \\ 3x + 1 & \text{if } x \geq 0 \end{cases}$$

$$D) f(x) = \sqrt[3]{x}$$

Which of the following $f'(0)$ exist

$$A) f(x) = |x|$$

$$B) f(x) = x^{\frac{2}{3}}$$

$$C) f(x) = \begin{cases} 2x & \text{if } x < 0 \\ x^2 + 2x & \text{if } x \geq 0 \end{cases}$$

$$D) f(x) = \begin{cases} 2x + 1 & \text{if } x < 0 \\ 3x + 1 & \text{if } x \geq 0 \end{cases}$$



Is the function given below continuous / differentiable at $x = 0$?

$$f(x) = \begin{cases} x^2 - 1 & \text{if } x < 0 \\ x + 1 & \text{if } x \geq 0 \end{cases}$$

- | | |
|---|--|
| A) <i>Continuous but not differentiable.</i> | B) <i>Differentiable but not continuous.</i> |
| C) <i>Both continuous and differentiable.</i> | D) <i>Neither continuous nor differentiable.</i> |

Which of the following functions is not differentiable at $x = 1$

- | | |
|-----------------------|--|
| A) $f(x) = x - 1 ^2$ | B) $f(x) = \frac{4x}{x-1}$ |
| C) $f(x) = x^2 - 1$ | D) $f(x) = \begin{cases} x^2 & \text{if } x < 1 \\ 2x - 1 & \text{if } x \geq 1 \end{cases}$ |

Which of the following functions is differentiable at $x = 1$?

- | | |
|--|-----------------------------|
| A) $f(x) = x - 1 $ | B) $f(x) = \sqrt[3]{x - 1}$ |
| C) $h(x) = \begin{cases} 2x & \text{if } x > 1 \\ x^2 & \text{if } x \leq 1 \end{cases}$ | D) $f(x) = (x - 1)^3$ |



8	Find the average velocity and the instantaneous velocity at a given point.	(21 – 24)	Page 161
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Q21a) The position given by $s(t) = -16t^2 + 40t + 10$, find the velocity.

A) $v(t) = -32$	B) $v(t) = -32t + 40$
C) $v(t) = 32t + 40$	D) $v(t) = -32t + 10$

Q21b) The position given by $s(t) = -16t^2 + 40t + 10$, find the acceleration.

A) $a(t) = -32t + 40$	B) $v(t) = -32t + 40$
C) $a(t) = 32$	D) $a(t) = -32$

Q22a) Find the velocity if the position given by $s(t) = -4.9t^2 + 12t - 3$

A) $v(t) = -9.8$	B) $a(t) = -9.8t + 12$
C) $v(t) = -9.8t + 12$	D) $a(t) = -9.8$

Q22b) Find the acceleration if the position given by $s(t) = -4.9t^2 + 12t - 3$

A) $v(t) = -9.8$	B) $a(t) = -9.8t + 12$
C) $v(t) = -9.8t + 12$	D) $a(t) = -9.8$

Q23) Find the velocity if the position given by $s(t) = \sqrt{t} + 2t^2$

A) $v(t) = \frac{1}{2\sqrt{t}} + 4t$	B) $v(t) = \frac{1}{\sqrt{t}} + 4t$
C) $v(t) = t^{\frac{1}{2}} + 4$	D) $v(t) = -\frac{1}{4\sqrt{t^3}} + 4$



Q23b) Find the acceleration if the position given by $s(t) = \sqrt{t} + 2t^2$

A) $a(t) = \frac{1}{2\sqrt{t}} + 4t$

B) $a(t) = \frac{1}{\sqrt{t}} + 4t$

C) $a(t) = t^{\frac{1}{2}} + 4$

D) $a(t) = -\frac{1}{4}t^{-\frac{3}{2}} + 4$

Q24a) Find the velocity if the position given by $s(t) = 10 - \frac{10}{t}$

A) $v(t) = -10$

B) $v(t) = 10t^{-2}$

C) $v(t) = 20t^{-3}$

D) $v(t) = -\frac{20}{t^3}$

Q24b) Find the acceleration if the position given by $s(t) = 10 - \frac{10}{t}$

A) $a(t) = -10$

B) $a(t) = 10t^{-2}$

C) $a(t) = 20t^{-3}$

D) $a(t) = -\frac{20}{t^3}$

Q21) Find the average velocity of the position function over the interval $1 \leq t \leq 2$

$$s(t) = \sqrt{t^2 + 8t}$$

A) 1

B) 1.34

C) 1.47

D) -1.47



Q21) Find the instantaneous velocity of the position function $s(t) = \sqrt{t^2 + 8t}$ at $x = 2$

A) 1

B) 1.34

C) 1.47

D) -1.47

Q22) Find the average velocity of the position function over the interval $1.9 \leq t \leq 2$
 $s(t) = 3\sin(t - 2)$

A) 2.995

B) -2.995

C) 0.052

D) 3

Q22) Find the velocity of the position function $s(t) = 3\sin(t - 2)$ at $x = 2$

A) 2.995

B) -2.995

C) 0.052

D) 3

9

Apply the chain rule for differentiation

(31 – 38)

Page 177

Q31) Given that the function $h(x) = f(g(x))$ use the relevant information $f(1) = 3$, $g(1) = 2$, $f'(1) = 4$, $f'(2) = 3$, $g'(1) = -2$, $g'(3) = 5$, to compute $h'(1)$.

A) 3

B) -6

C) 5

D) 20

Q32) Given that the function $h(x) = f(g(x))$ use the relevant information $f(2) = 1$, $g(2) = 3$, $f'(2) = -1$, $f'(3) = -3$, $g'(1) = 2$, $g'(2) = 4$ to compute $h'(2)$.

A) 1

B) 4

C) -12

D) 12

Q35a) Find the derivative of $f(x^2)$

A) $2f'(2x)$

B) $2xf(x^2)$

C) $f'(2x)$

D) $2xf'(x^2)$



Q35b) Find the derivative of $[f(x)]^2$

A) $2f(x)$	B) $f(x)f'(x)$
C) $2f'(x)$	D) $2f(x)f'(x)$

Q35c) Find the derivative of $f(f(x))$

A) $f'(x)$	B) $f(x)f'(x)$
C) $f(f(x))f'(x)$	D) $f'(x)f'(f(x))$

Q36a) Find the derivative of $f(\sqrt{x})$

A) $\frac{f'(\sqrt{x})}{2\sqrt{x}}$	B) $\frac{f'(\sqrt{x})}{\sqrt{x}}$
C) $f'(\sqrt{x})x^{\frac{1}{2}}$	D) $f'\left(\frac{1}{2}x^{-\frac{1}{2}}\right)$

Q36b) Find the derivative of $\sqrt{f(x)}$

A) $\frac{1}{2\sqrt{f(x)}}$	B) $\frac{f'(x)}{2\sqrt{f(x)}}$
C) $\frac{1}{2}(f(x))^{\frac{1}{2}}$	D) $\frac{f'(x)}{\sqrt{f(x)}}$



Q36c) Find the derivative of $f(xf(x))$

A) $f'(xf(x))(f(x) + xf'(x))$	B) $f(xf(x))(f(x) + xf'(x))$
C) $f'(xf(x))(1f'(x))$	D) $f'(f(x) + xf'(x))$

Q37a) Find the derivative of $f\left(\frac{1}{x}\right)$

A) $f'\left(-\frac{1}{x^2}\right)$	B) $f'\left(\frac{1}{x^2}\right)$
C) $-\frac{f'\left(\frac{1}{x}\right)}{x^2}$	D) $\frac{f'\left(\frac{1}{x}\right)}{x^2}$

Q37b) Find the derivative of $\frac{1}{f(x)}$

A) $f^{-1}(x)$	B) $-\frac{f'(x)}{(f(x))^2}$
C) $\frac{f'(x)}{(f(x))^2}$	D) $-\frac{f'(x)}{f(x)}$

Q37c) Find the derivative of $f\left(\frac{x}{f(x)}\right)$

A) $\frac{f'\left(\frac{x}{f(x)}\right)(f(x) - xf'(x))}{(f(x))^2}$	B) $f'\left(\frac{f(x) - xf'(x)}{(f(x))^2}\right)$
C) $f\left(\frac{x}{f(x)}\right)\left(\frac{f(x) - xf'(x)}{(f(x))^2}\right)$	D) $\frac{f(x) - xf'(x)}{(f(x))^2}$



Ms. Islam Ismail

12 Advanced Math Worksheets
Unit 3 : Differentiation

Q38a) $\frac{d}{dx} (1 + f(x^2))$

A) $f(2x)$	B) $f'(2x)$
C) $2xf'(x^2)$	D) $2xf(x^2)$

Q38b) $\frac{d}{dx} (1 + f(x))^2$

A) $f'(x)$	B) $2(1 + f(x))f'(x)$
C) $2f'(x)$	D) $2(1 + f'(x))$

Q38c) $\frac{d}{dx} (f(1 + f(x)))$

A) $f'(1 + f(x))f'(x)$	B) $f(1 + f'(x))$
C) $f(1 + f(x))f'(x)$	D) $f'(1 + f(x))$



10	Apply the chain rule for differentiation	(17 – 22)	Page 176
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Q17) If $f(x) = x^3 + 4x - 1$ has inverse function g . Find $g'(-1)$

A) -1	B) 4
C) $\frac{1}{4}$	D) 1

Q18) If $f(x) = x^5 + 4x - 2$ has inverse function g . Find $g'(-2)$

A) 4	B) -24
C) 24	D) $\frac{1}{4}$

Q19) If $f(x) = x^5 + 3x^3 + x$ has inverse function g . Find $g'(5)$

A) $\frac{1}{15}$	B) 15
C) 3351	D) $-\frac{1}{15}$

Q20) If $f(x) = x^3 + 2x + 1$ has inverse function g . Find $g'(-2)$

A) $-\frac{1}{5}$	B) $\frac{1}{5}$
C) 5	D) 14

Q21) If $f(x) = \sqrt{x^3 + 2x + 4}$ has inverse function g . Find $g'(2)$

A) $\frac{1}{2}$	B) $\frac{7}{4}$
C) $\frac{4}{7}$	D) 2

Q22) If $f(x) = \sqrt{x^5 + 4x^3 + 3x + 1}$ has inverse function g . Find $g'(3)$

A) 13	B) $\frac{3}{10}$
C) $\frac{10}{3}$	D) $\frac{1}{13}$



11	Find the derivatives of trigonometric functions using differentiation rules.	(19 – 22)	Page 184
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Q19a) Find the derivative of function

$$f(x) = \sin x^2$$

A) $f'(x) = x \sin x^2$	B) $f'(x) = 2x \sin 2x$
C) $f'(x) = 2x \cos x^2$	D) $f'(x) = x^2 \sin 2x$

Q19b) Find the derivative of function

$$f(x) = \sin^2 x$$

A) $f'(x) = -2 \sin x \cos x$	B) $f'(x) = \sin x \cos x$
C) $f'(x) = 2x \cos^2 x$	D) $f'(x) = \sin 2x$

Q19c) Find the derivative of function

$$f(x) = \sin 2x$$

A) $f'(x) = 2 \cos x$	B) $f'(x) = 2 \cos x$
C) $f'(x) = 2 \cos 2x$	D) $f'(x) = \cos 2x$

Q20a) Find the derivative of function

$$f(x) = \cos \sqrt{x}$$

A) $f'(x) = \frac{1}{2\sqrt{x}} \sin \sqrt{x}$	B) $f'(x) = -\frac{1}{2\sqrt{x}} \sin \sqrt{x}$
C) $f'(x) = -\sqrt{x} \sin \sqrt{x}$	D) $f'(x) = -\frac{1}{2\sqrt{x}} \cos \sqrt{x}$



Q20b) Find the derivative of function

$$f(x) = \sqrt{\cos x}$$

A) $f'(x) = -\frac{1}{2} \sin x (\cos x)^{-1/2}$

B) $f'(x) = -\tan x \sqrt{\cos x}$

C) $f'(x) = \frac{1}{2} \tan x \sqrt{\cos x}$

D) $f'(x) = -\frac{1}{2} \tan \sqrt{\cos x}$

Q20c) Find the derivative of function

$$f(x) = \cos \frac{1}{2} x$$

A) $f'(x) = \frac{1}{2} \cos \frac{1}{2} x$

B) $f'(x) = \frac{1}{2} \sin \frac{1}{2} x$

C) $f'(x) = -\frac{1}{2} \sin \frac{1}{2} x$

D) $f'(x) = -2 \sin \frac{1}{2} x$

Q21a) Find the derivative of function

$$f(x) = \sin x^2 \tan x$$

A) $f'(x) = 2x \cos x \tan x^2 + \sin x^2 \sec^2 x$

B) $f'(x) = 2 \cos x^2 \tan x + \sin x^2 \sec^2 x$

C) $f'(x) = 2x \cos x^2 \tan x + \sin x^2 \sec^2 x$

D) $f'(x) = 2x \cos x^2 \tan x - \sin x^2 \sec^2 x$

Q21b) Find the derivative of function

$$f(x) = \sin^2(\tan x)$$

A) $f'(x) = -2 \sin(\tan x) \cos(\tan x) \sec^2 x$

B) $f'(x) = 2 \sin(\tan x) \cos(\tan x) \sec^2 x$

C) $f'(x) = \sin(\tan x) \cos(\tan x) \sec^2 x$

D) $f'(x) = 2 \cos(\tan x) \sec^2 x$



Q21c) Find the derivative of function

$$f(x) = \sin(\tan^2 x)$$

- A) $f'(x) = -2 \tan x \sec^2 x \cos(\tan^2 x)$
 B) $f'(x) = 2 \sec^2 x \cos(\tan^2 x)$
 C) $f'(x) = 2 \tan x \sec^2 x \cos(\tan^2 x)$
 D) $f'(x) = \tan x \sec^2 x \cos(\tan^2 x)$

Q22a) Find the derivative of function

$$f(x) = \sec x^2 \tan x^2$$

- A) $f'(x) = -2x \sec x^2 [\sec^2 x^2 + \tan^2 x^2]$
 B) $f'(x) = 2x \sec x^2 [\sec^2 x^2 - \tan^2 x^2]$
 C) $f'(x) = 2x \sec x^2 [\sec^2 x^2 + \tan^2 x^2]$
 D) $f'(x) = x \sec x^2 [\sec^2 x^2 + \tan^2 x^2]$

Q22b) Find the derivative of the function

$$f(x) = \sec^2(\tan x)$$

- A) $f'(x) = \sec^2(\tan x) \tan(\tan x) \sec^2 x$
 B) $f'(x) = 2 \sec^2(\tan x) \tan(\tan x) \sec^2 x$
 C) $f'(x) = 2 \sec^2(\tan x) \tan(\tan x)$
 D) $f'(x) = 2 \sec(\tan x) \tan(\tan x) \sec^2 x$



Q22c) Find the derivative of function

$$f(x) = \sec(\tan^2 x)$$

A) $f'(x) = -2 \tan x \sec^2 x \sec(\tan^2 x) \tan(\tan^2 x)$

B) $f'(x) = 2 \sec^2 x \sec(\tan^2 x) \tan(\tan^2 x)$

C) $f'(x) = \tan x \sec^2 x \sec(\tan^2 x) \tan(\tan^2 x)$

D) $f'(x) = 2 \tan x \sec^2 x \sec(\tan^2 x) \tan(\tan^2 x)$



12	Find derivatives of natural logarithmic functions.	(1 – 14)	Page 192
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Q1) Find the derivative of function $f(x) = x^3 e^x$

A) $f'(x) = x^2 e^x (x + 3)$	B) $f'(x) = x e^x (x + 3)$
C) $f'(x) = x^3 e^x (x + 3)$	D) $f'(x) = x^2 e^x (3x + 1)$

Q2) Find the derivative of function $f(x) = e^{2x} \cos 4x$

- A. $f'(x) = e^{2x} (\cos 4x - 2 \sin 4x) x$
- B. $f'(x) = 2e^{2x} (\cos 4x + 2 \sin 4x)$
- C. $f'(x) = 2e^{2x} (\cos 4x - 2 \sin 4x)$
- D. $f'(x) = e^{2x} (\cos 4x + 2 \sin 4x) x$

Q3) Find the derivative of function $f(t) = t + 2^t$

A) $f'(t) = 2^t \ln 2$	B) $f'(t) = t + 2^t \ln 2$
C) $f'(t) = 1 + 2^t$	D) $f'(t) = 1 + 2^t \ln 2$

Q4) Find the derivative of function $f(t) = t 4^{3t}$

A) $f'(t) = 4^{3t} (1 + 3t \ln 2)$	B) $f'(t) = 4^{3t} (1 + 3t \ln 4)$
C) $f'(t) = 4^{3t} (1 + 6t \ln 2)$	D) $f'(t) = 4^{3t} (3 + t \ln 4)$

Q5) Find the derivative of function $f(x) = 2e^{4x+1}$

A) $f'(x) = e^{4x+1}$	B) $f'(x) = 8e^{4x+1}$
C) $f'(x) = 4e^{4x+1}$	D) $f'(x) = 4xe^{4x+1}$

Q6) Find the derivative of function $f(x) = \left(\frac{1}{e}\right)^x$

A) $f'(x) = -e^{-x}$	B) $f'(x) = e^{-x}$
C) $f'(x) = -e^x$	D) $f'(x) = e^x$

Q7) Find the derivative of function $h(x) = (1/3)^{x^2}$

A) $f'(x) = 2x \ln 3 \left(\frac{1}{3}\right)^{x^2}$	B) $f'(x) = 2x \left(\frac{1}{3}\right)^{x^2}$
C) $f'(x) = -2x \ln 3 \left(\frac{1}{3}\right)^{x^2}$	D) $f'(x) = \ln 3 \left(\frac{1}{3}\right)^{x^2}$

Q8) Find the derivative of function $h(x) = 4^{-x^2}$

A) $f'(x) = 2x 4^{-x^2} \ln 4$	B) $f'(x) = -2x 4^{-x^2} \ln 4$
C) $f'(x) = -2x 4^{-2x} \ln 4$	D) $f'(x) = -2x 4^{-x^2}$

Q9) Find the derivative of function $f(u) = e^{u^2+4u}$

A) $f'(u) = (2u + 4)e^{u^2+4u}$

B) $f'(u) = (u + 2)e^{u^2+4u}$

C) $f'(u) = (2u + 2)e^{u^2+4u}$

D) $f'(u) = (2u)e^{u^2+4u}$

Q10) Find the derivative of the function $f(u) = 3e^{\tan u}$

A) $f'(u) = 3 \tan u \cdot e^{\sec^2 u}$

B) $f'(u) = 3e^{\sec^2 u}$

C) $f'(u) = 3 \cot^2 u \cdot e^{\tan u}$

D) $f'(u) = 3 \sec^2 u \cdot e^{\tan u}$

Q11) Find the derivative of the function $f(w) = \frac{e^{4w}}{w}$

A) $f'(w) = \frac{e^{4w}(4w-1)}{w}$

B) $f'(w) = \frac{e^{4w}(4w-1)}{w^2}$

C) $f'(w) = \frac{e^{4w}(w-1)}{w^2}$

D) $f'(w) = \frac{e^{4w}(w-4)}{w^2}$



Q12) Find the derivative of function $f(w) = \frac{w}{e^{6w}}$

A) $f'(w) = \frac{(1-6w)}{e^{6w}}$	B) $f'(w) = \frac{(1-6w)}{e^{12w}}$
C) $f'(w) = \frac{(6-w)}{e^{12w}}$	D) $f'(w) = \frac{(6-w)}{e^{6w}}$

Q13) Find the derivative of function $f(x) = \ln 2x$

A) $f'(x) = \frac{2}{x}$	B) $f'(x) = \frac{1}{x}$
C) $f'(x) = \frac{1}{2x}$	D) $f'(x) = 2x$

Q14) Find the derivative of function $f(x) = \ln \sqrt{8x}$

A) $f'(x) = \frac{8}{x}$	B) $f'(x) = \frac{1}{2x}$
C) $f'(x) = \frac{1}{x}$	D) $f'(x) = \frac{1}{8x}$

13	Find the derivatives of trigonometric functions using differentiation rules.	(29 – 34)	Page 204
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Q29a) Find the derivative of function

$$f(x) = \sin^{-1}(x^3 + 1)$$

A) $f'(x) = \frac{3x^2}{\sqrt{1-(x^3+1)}}$	B) $f'(x) = \frac{3x^2}{\sqrt{1-(x^3+1)^2}}$
C) $f'(x) = \frac{1}{\sqrt{1-(x^3+1)^2}}$	D) $f'(x) = \frac{3x^2+1}{\sqrt{1-(x^3+1)^2}}$

Q29b) Find the derivative of function

$$f(x) = \sin^{-1}(\sqrt{x})$$

A) $f'(x) = \frac{1}{2\sqrt{x(1-x)}}$	B) $f'(x) = \frac{1}{\sqrt{x(1-x)}}$
C) $f'(x) = \frac{1}{2\sqrt{(1-x)}}$	D) $f'(x) = \frac{\sqrt{x}}{2\sqrt{(1-x)}}$

Q30a) Find the derivative of function

$$f(x) = \cos^{-1}(x^2 + x)$$

A) $f'(x) = -\frac{2x+1}{\sqrt{1-(x^2+x)^2}}$	B) $f'(x) = \frac{2x+1}{\sqrt{1-(x^2+x)^2}}$
C) $f'(x) = -\frac{2x+1}{\sqrt{1-(x^2+x)}}$	D) $f'(x) = -\frac{x^2+x}{\sqrt{1-(x^2+x)^2}}$

Q30b) Find the derivative of function

$$f(x) = \cos^{-1}\left(\frac{2}{x}\right)$$

A) $f'(x) = -\frac{1}{\sqrt{1-\left(\frac{2}{x}\right)^2}}$	B) $f'(x) = \frac{2}{x\sqrt{x^2-4}}$
C) $f'(x) = \frac{2}{x\sqrt{4-x^2}}$	D) $f'(x) = \frac{1}{\sqrt{1-\left(\frac{2}{x}\right)^2}}$



Q31a) Find the derivative of function

$$f(x) = \tan^{-1}(\sqrt{x})$$

A) $f'(x) = \frac{1}{1+x}$

B) $f'(x) = \frac{1}{\sqrt{x}(1+x)}$

C) $f'(x) = \frac{1}{2\sqrt{x}(1+x)}$

D) $f'(x) = \frac{2\sqrt{x}}{1+x}$

Q31b) Find the derivative of function

$$f(x) = \tan^{-1}\left(\frac{1}{x}\right)$$

A) $f'(x) = \frac{1}{1-x^2}$

B) $f'(x) = \frac{1}{x^2+1}$

C) $f'(x) = \frac{-2x^2}{1+\frac{1}{x^2}}$

D) $f'(x) = -\frac{1}{x^2+1}$

Q32a) Find the derivative of function

$$f(x) = \sqrt{2 + \tan^{-1} x}$$

A) $f'(x) = \frac{1}{(1+x^2)\sqrt{2+\tan^{-1} x}}$

B) $f'(x) = \frac{2(1+x^2)}{\sqrt{2+\tan^{-1} x}}$

C) $f'(x) = \frac{1}{2(1+x^2)\sqrt{2+\tan^{-1} x}}$

D) $f'(x) = \frac{2}{(1+x^2)\sqrt{2+\tan^{-1} x}}$

Q32b) Find the derivative of function

$$f(x) = e^{\tan^{-1}(x)}$$

A) $f'(x) = e^{\tan^{-1}(x)}(1+x^2)$

B) $f'(x) = -\frac{e^{\tan^{-1}(x)}}{1+x^2}$

C) $f'(x) = \frac{e^{\tan^{-1}(x)}}{1+x^2}$

D) $f'(x) = e^{\tan^{-1}(x)}$



Q33a) Find the derivative of function

$$f(x) = 4 \sec(x^4)$$

A) $f'(x) = 4 \sec(x^4) \tan(x^4)$

B) $f'(x) = 16x^3 \sec(x^4) \tan(x^4)$

C) $f'(x) = 4 \sec(4x^3) \tan(4x^3)$

D) $f'(x) = 4x^3 \sec(x^4) \tan(x^4)$

Q33b) Find the derivative of function

$$f(x) = 4 \sec^{-1}(x^4)$$

A) $f'(x) = \frac{16}{x\sqrt{x^8-1}}$

B) $f'(x) = \frac{16}{\sqrt{x^8-1}}$

C) $f'(x) = \frac{16}{x\sqrt{1-x^8}}$

D) $f'(x) = \frac{16}{x\sqrt{x^8-1}}$

Q34a) Find the derivative of function

$$f(x) = \sin^{-1}\left(\frac{1}{x}\right)$$

A) $f'(x) = \frac{1}{x\sqrt{x^2-1}}$

B) $f'(x) = -\frac{1}{x\sqrt{1-x^2}}$

C) $f'(x) = -\frac{1}{x\sqrt{x^2-1}}$

D) $f'(x) = \frac{1}{\sqrt{1-\left(\frac{1}{x}\right)^2}}$

Q34b) Find the derivative of function

$$f(x) = \csc^{-1}x$$

A) $f'(x) = \frac{1}{|x|\sqrt{x^2-1}}$

B) $f'(x) = -\frac{1}{|x|\sqrt{1-x^2}}$

C) $f'(x) = -\frac{1}{|x|\sqrt{x^2-1}}$

D) $f'(x) = \frac{1}{\sqrt{1-\left(\frac{1}{x}\right)^2}}$



17	a) Find the derivative of a function at a given point b) Write the equation of a tangent line using derivative	(5 – 12)	Page 153
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Finding the Derivative of the function f

The derivative of the function f is the function f' given by

$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

Exercises Page 151: Using definition of derivative to Compute the derivative function

Q5). $f(x) = 3x^2 + 1$



Q6). $f(x) = x^2 - 2x + 1$

Q9). $f(x) = \frac{3}{x+1}$



Q10) $f(x) = \frac{2}{2x-1}$

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Q12) $f(t) = \sqrt{2t+4}$

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Q11). $f(t) = \sqrt{3t + 1}$

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Q7). $f(x) = x^3 + 2x - 1$

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Q8). $f(x) = x^4 - 2x^2 + 1$

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18	Find derivatives implicitly.	(5 – 16)	Page 219
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Exercise page 204: find the derivative $y'(x)$ implicitly.

Q5) $x^2y^2 + 3y = 4x$

Q6) $3xy^3 - 4x = 10y^2$

Q7) $\sqrt{xy} - 4y^2 = 12$

Q8) $\sin xy = x^2 - 3$



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Q9) $\frac{x+3}{y} = 4x + y^2$

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Q10) $3x + y^3 - \frac{4y}{x+2} = 10x^2$

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Q11) $e^{x^2}y - e^y = x$

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Q12) $xe^y - 3y \sin x = 1$

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Q13) $y^2 \sqrt{x+y} - 4x^2 = y$

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Q14) $x \cos(x+y) - y^2 = 8$

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Q15) $e^{4y} - \ln(y^2 + 3) = 2x$

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Q16) $e^{x^2} y - 3\sqrt{y^2 + 2} = x^2 + 1$

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19	Understand the Mean Value Theorem and use it in applications.	(1-6)	Page 219
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Exercises page 219: check the hypotheses of the Mean Value Theorem and find a value of c that makes the appropriate conclusion true.

Q1). $f(x) = x^2 + 1, [0,2]$

Q2). $f(x) = x^2 + 1, [-2,2]$



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Q3). $f(x) = x^3 + x^2, [-1,1]$

Q4). $f(x) = x^3 + x^2, [0,1]$

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Q5). $f(x) = \sin x$, $[-\pi, 0]$

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Q6). $f(x) = \sin x$, $[0, \frac{\pi}{2}]$

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