2.1 Chain Rule: Quiz B Interview

Name: _____ TOTAL _____ / 40

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Fill out this document and send back photos.

GRADING RULES No work shown: at most half the points. Any valid method counts. Any equivalent form counts. Asked for $h'(2)$ but gave $h(2)$, or asked for $h(2)$ but gave $h'(2)$: 0 points. Blank or out of time: write T next to the points.

QUICK CHECKS (no looking at the quiz)

C1 $\dfrac{d}{dx}\big[A(B(x))\big] = \left(\dfrac{d}{ds}\big[A(s)\big]\right)\Big|_{s=_____} \cdot _____$

C2 $h(x) = f(g(x))$. $\quad h'(3) = f'(_____) \cdot g'(_____)$

C3 x is a function of y. $\quad \dfrac{d}{dy}\big[x^5\big] = _____$

C4 $\dfrac{d}{d(x^2)}\Big[(x^2)^5\Big] = _____$

1(a)

points _____ / 2

ANSWER

$3(2x^3 - x + 5)^2(6x^2 - 1)$

Your answer has two factors? no points

- ◯ yes → ◯ **1 pt** one factor is $3(2x^3 - x + 5)^2$; ◯ **1 pt** the other factor is $(6x^2 - 1)$
- ◯ no → **0 points, unless your answer can be re-expressed as** $3(2x^3 - x + 5)^2(6x^2 - 1)$

All point bubbles filled? YES → **next card**

NO

Your answer ends with $\cdot(6x^2 - 1)$**?**

- ◯ yes → **In front of** $\cdot(6x^2 - 1)$ **you wrote:**
  - ◯ $3(2x^3 - x + 5)^3$
  - ◯ $(2x^3 - x + 5)^2$, with no 3
  - ◯ another expression
- ◯ no → **Inside** $(\ \ )^2$ **you wrote:**
  - ◯ $2x^3 - x + 5$
  - ◯ $6x^2 - 1$

1(b)

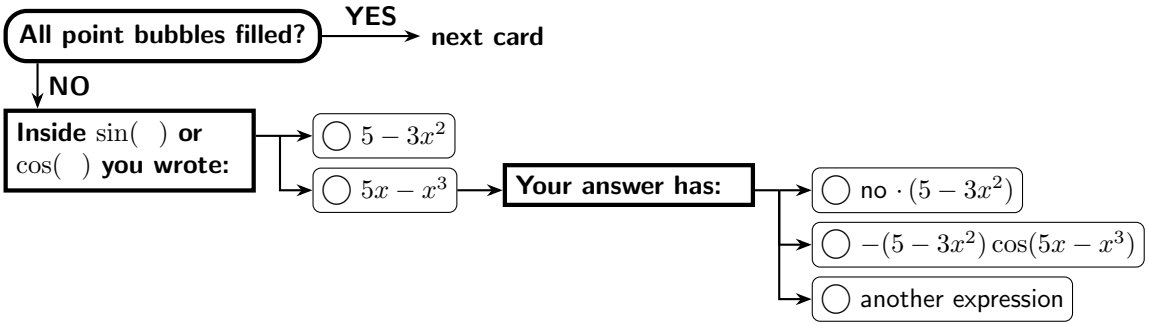
points _____ / 2

ANSWER

$(5-3x^2)\cos(5x-x^3)$

◯ **1 pt** has $\cos(5x-x^3)$ times $(5-3x^2)$ or $(3x^2-5)$

◯ **1 pt** your whole answer matches one of: $(5-3x^2)\cos(5x-x^3)$, $\cos(5x-x^3)\cdot(5-3x^2)$, $-(3x^2-5)\cos(5x-x^3)$

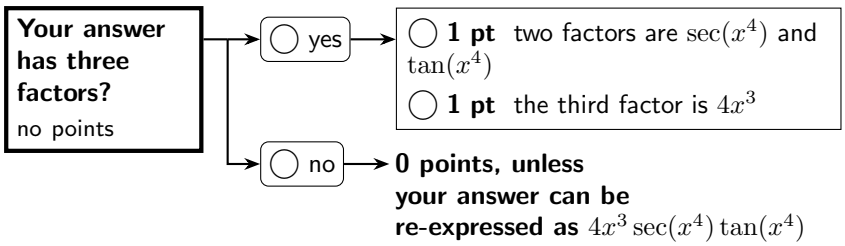


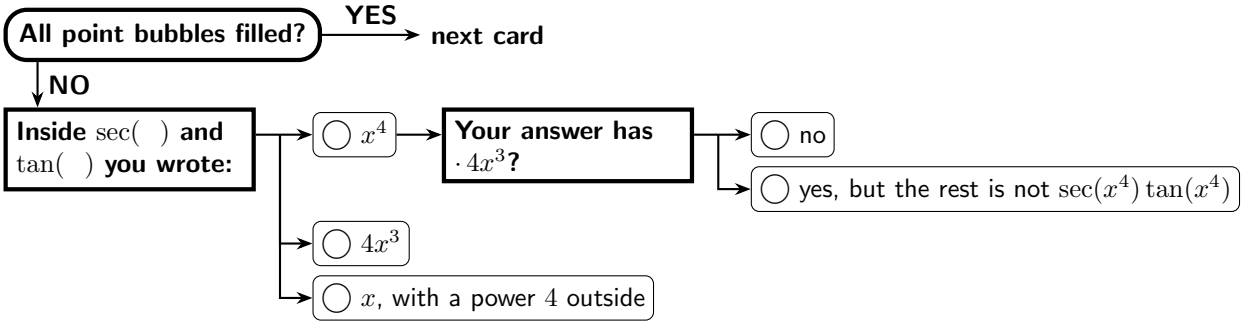
1(c)

points _____ / 2

ANSWER

$4x^3\sec(x^4)\tan(x^4)$





1(d)

points _____ / 2

ANSWER

$$\frac{2x+5}{3(x^2+5x)^{2/3}}$$

Your answer has two factors? no points

- ◯ yes → ◯ **1 pt** one factor is $\frac{1}{3}(x^2+5x)^{-2/3}$
  ◯ **1 pt** the other factor is $(2x+5)$
- ◯ no → **0 points, unless your answer can be re-expressed as** $\frac{2x+5}{3(x^2+5x)^{2/3}}$

All point bubbles filled? → **YES** → **next card**

NO

Inside the root or the $(\ )^{-2/3}$ you wrote:

- ◯ $2x+5$
- ◯ x^2+5x → **Your answer has:**
  - ◯ no $\cdot\,(2x+5)$
  - ◯ an exponent other than $-\frac{2}{3}$
- ◯ $\sqrt[3]{x^2+5x}$ kept as a root

1(e)

points _____ / 2

ANSWER

$$2t(3t+1)^4+12t^2(3t+1)^3$$

Your answer has two terms? no points

- ◯ yes → ◯ **1 pt** one term is $2t(3t+1)^4$
  ◯ **1 pt** the other term is $12t^2(3t+1)^3$
- ◯ no → **0 points, unless your answer can be re-expressed as** $2t(3t+1)^4+12t^2(3t+1)^3$

All point bubbles filled? → **YES** → **next card**

NO

Number of terms added in your answer:

- ◯ 1 → **Your one term is:**
  - ◯ $2t\cdot 12(3t+1)^3$
  - ◯ another expression
- ◯ 2 → **Your second term is:**
  - ◯ $4t^2(3t+1)^3$
  - ◯ $108t^2$, from $4(3)^3$
  - ◯ another expression

1(f)

points _____ / 2

ANSWER

$$\frac{36}{(1-3x)^4}$$

◯ **1 pt** has $(1-3x)^{-4}$, or $(1-3x)^4$ in a denominator

◯ **1 pt** your whole answer matches one of: $\frac{36}{(1-3x)^4}$, $36(1-3x)^{-4}$, $-12(1-3x)^{-4}\cdot(-3)$

All point bubbles filled? → **YES** → **next card**

NO →

Your answer has x?

- ◯ no: $-\frac{4}{27}$
- ◯ yes → **The number on top is:**
  - ◯ -12
  - ◯ another number

2(a)

points _____ / 2

ANSWER

0

◯ **2 pts** answer $= 0$

All point bubbles filled? → **YES** → **next card**

NO →

Your answer:

- ◯ answer $\neq 0$
- ◯ blank: no work

2(b)

points _____ / 2

ANSWER

0

◯ **2 pts** answer $= 0$

All point bubbles filled? → **YES** → **next card**

NO →

Your answer:

- ◯ answer has t
- ◯ blank: no work

2(c)

points _____ / 2

ANSWER

$4\left(\tan(2x)+x^6-3\sqrt[3]{x}\right)^3$

◯ **2 pts** answer $= 4\left(\tan(2x)+x^6-3\sqrt[3]{x}\right)^3$

All point bubbles filled? → **YES** → **next card**

NO →

Your answer:

- ◯ answer has $6x^5$
- ◯ blank: no work

3(a)

points _____ / 2

ANSWER

1

◯ **2 pts** answer $= 1$

All point bubbles filled? → **YES** → **next card**

NO →

Your answer:

- ◯ 0
- ◯ from $f'(g'(2)) = f'\left(\frac{1}{5}\right)$
- ◯ another number

3(b)

points _____ / 2

ANSWER

1

◯ **2 pts** answer $= 1$

All point bubbles filled? → **YES** → **next card**

NO

Inside $g'(\ \ )$ you wrote:

- ◯ x
- ◯ $f'(x)$
- ◯ $f(x)$, stuck
- ◯ no g'

4(a)

points _____ / 2

ANSWER

$$8x^3\frac{dx}{dy}+3y^2$$

Your answer has two terms? no points

- ◯ yes → ◯ **1 pt** one term is $8x^3\frac{dx}{dy}$; ◯ **1 pt** the other term is $3y^2$
- ◯ no → **0 points, unless your answer can be re-expressed as** $8x^3\frac{dx}{dy}+3y^2$

All point bubbles filled? → **YES** → **next card**

NO

Your answer has $\frac{dx}{dy}$?

- ◯ no
- ◯ yes → **Your answer has:**
  - ◯ no $+3y^2$
  - ◯ $8\left(\frac{dx}{dy}\right)^3$

4(b)

points _____ / 2

ANSWER

$3x^2 \sec^2(x^3) \dfrac{dx}{dy}$

Your answer has three factors? no points

- ◯ yes → ◯ **1 pt** two factors are $\sec^2(x^3)$ and $\dfrac{dx}{dy}$
  ◯ **1 pt** the third factor is $3x^2$
- ◯ no → **0 points, unless your answer can be re-expressed as** $3x^2 \sec^2(x^3) \dfrac{dx}{dy}$

All point bubbles filled? → **YES** → **next card**

NO

Your answer has $\dfrac{dx}{dy}$?

- ◯ no
- ◯ yes → **Inside** $\sec^2(\ \ )$ **you wrote:**
  - ◯ x^3, with no $\cdot\, 3x^2$
  - ◯ $3x^2 \dfrac{dx}{dy}$

5(a)

points _____ / 3

ANSWER

-2

◯ **1 pt** $g(3) = -2$ and $g'(3) = -1$
◯ **1 pt** $f'(-2) = 2$
◯ **1 pt** answer -2

All point bubbles filled? → **YES** → **next card**

NO

Your answer:

- ◯ -1
- ◯ 2
- ◯ none: $f'(-1)$ at a corner
- ◯ another number

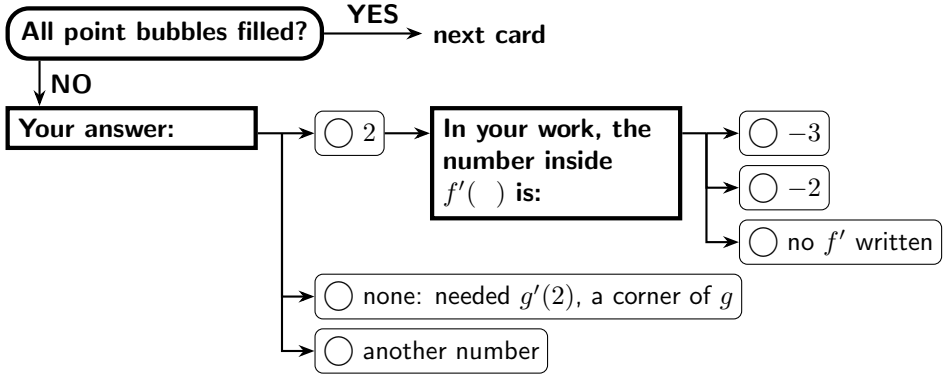
5(b)

points _____ / 3

ANSWER

4

◯ **1 pt** $f(-3) = -1$ and $f'(-3) = 2$
◯ **1 pt** $g'(-1) = 2$
◯ **1 pt** answer 4



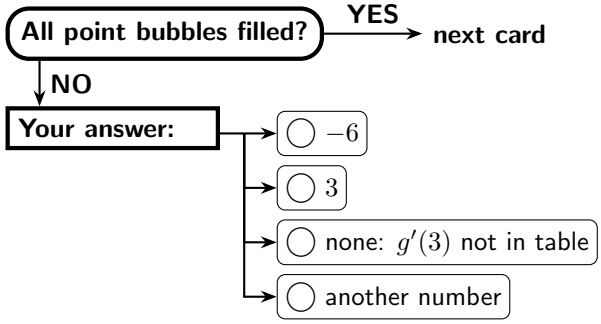
6(a)

points _____ / 3

ANSWER

9

◯ **1 pt** $f(2) = 0$
◯ **1 pt** $g'(0) = 3$ and $f'(2) = 3$
◯ **1 pt** answer 9



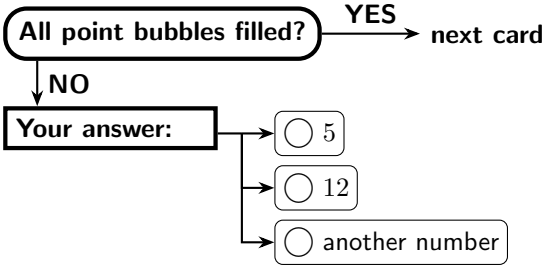
6(b)

points _____ / 3

ANSWER

20

◯ **1 pt** $k'(2) = f'(2^2) \cdot 2(2)$
◯ **1 pt** $f'(4) = 5$
◯ **1 pt** answer 20



6(c)

points _____ / 2

ANSWER

2

◯ **2 pts** answer $= 2$

