2.1 Chain Rule: Quiz A 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 $h'(1)$ but gave $h(1)$, or asked for $h(1)$ but gave $h'(1)$: 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 $\dfrac{d}{d(x^2)}\Big[\sin(x^2)\Big] = _____$

1(a)

points _____ / 2

ANSWER

$4(x^2-3x+1)^3(2x-3)$

Your answer has two factors? no points

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

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

NO ↓

Your answer ends with $\cdot(2x-3)$**?**

- ◯ yes → **In front of** $\cdot(2x-3)$ **you wrote:**
  - ◯ $4(x^2-3x+1)^4$
  - ◯ $(x^2-3x+1)^3$, with no 4
  - ◯ another expression
- ◯ no → **Inside** $(\ \ )^3$ **you wrote:**
  - ◯ x^2-3x+1
  - ◯ $2x-3$

1(b)

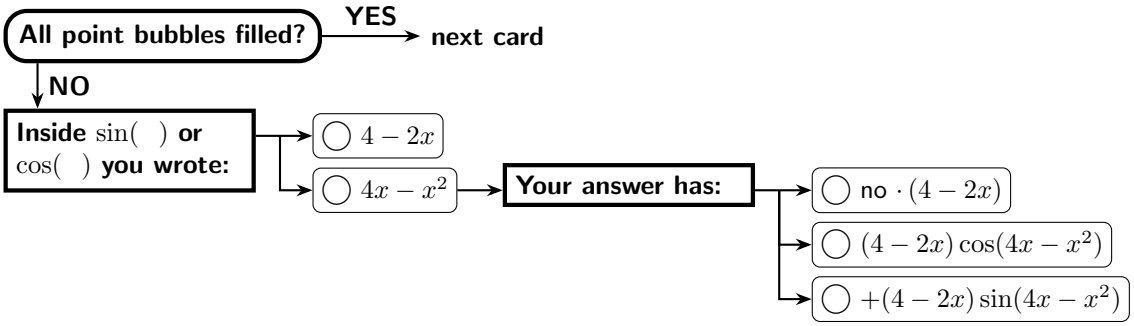
points _____ / 2

ANSWER

$(2x-4)\sin(4x-x^2)$

◯ **1 pt** has $\sin(4x-x^2)$ times $(4-2x)$ or $(2x-4)$

◯ **1 pt** your whole answer matches one of: $(2x-4)\sin(4x-x^2)$, $-(4-2x)\sin(4x-x^2)$, $-\sin(4x-x^2)\cdot(4-2x)$

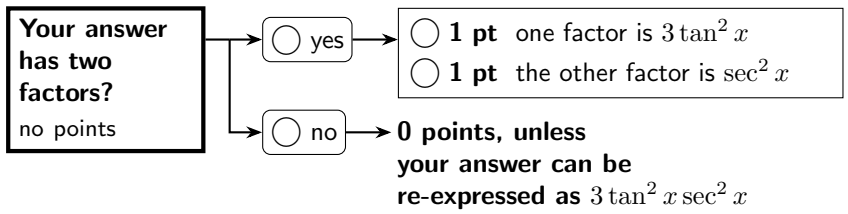


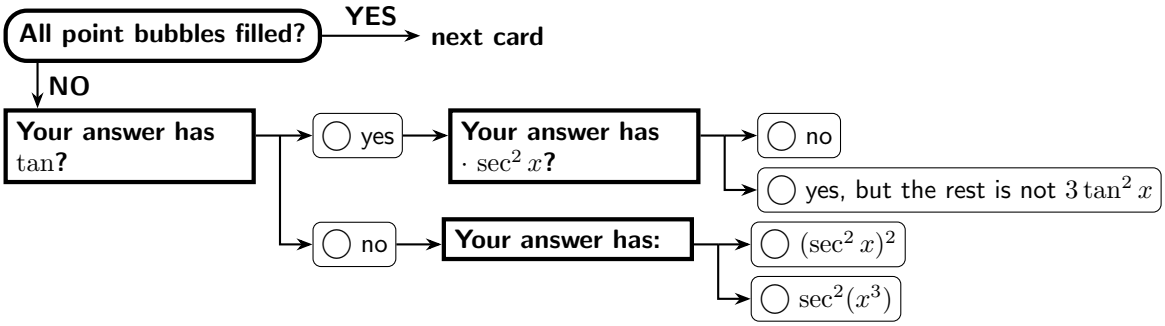
1(c)

points _____ / 2

ANSWER

$3\tan^2 x\sec^2 x$





1(d)

points _____ / 2

ANSWER

$$\frac{3x^2+6}{2\sqrt{x^3+6x}}$$

Your answer has two factors? no points

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

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

NO

Inside the root or the $(\ \ )^{-1/2}$ you wrote:

- ◯ $3x^2+6$
- ◯ x^3+6x → **Your answer has:**
  - ◯ no $\cdot\,(3x^2+6)$
  - ◯ an exponent other than $-\frac{1}{2}$
- ◯ $\sqrt{x^3+6x}$ kept as a root

1(e)

points _____ / 2

ANSWER

$$(2t-5)^3+6t(2t-5)^2$$

Your answer has two terms? no points

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

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

NO

Number of terms added in your answer:

- ◯ 1 → **Your one term is:**
  - ◯ $6(2t-5)^2$
  - ◯ another expression
- ◯ 2 → **Your second term is:**
  - ◯ $3t(2t-5)^2$
  - ◯ $12t$, from $3(2)^2$
  - ◯ another expression

1(f)

points _____ / 2

ANSWER

$$\frac{24}{(1-2x)^3}$$

◯ **1 pt** has $(1-2x)^{-3}$, or $(1-2x)^3$ in a denominator

◯ **1 pt** your whole answer matches one of: $\frac{24}{(1-2x)^3}$, $24(1-2x)^{-3}$, $-12(1-2x)^{-3}\cdot(-2)$

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

NO →

Your answer has x?

- ◯ no: $\frac{3}{2}$
- ◯ yes → **The number on top is:**
  - ◯ -12
  - ◯ another expression

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

$\cos\left(x^5 - 4\sqrt{x} + \sec(3x)\right)$

◯ **2 pts** answer $= \cos\left(x^5 - 4\sqrt{x} + \sec(3x)\right)$

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

NO →

Your answer:

- ◯ answer has $5x^4$
- ◯ blank: no work

3(a)

points _____ / 2

ANSWER

1

◯ **2 pts** answer $= 1$

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

NO →

Your answer:

- ◯ 75
- ◯ $\frac{25}{4}$
- ◯ $\frac{169}{48}$
- ◯ 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

$15x^4\dfrac{dx}{dy}+4$

Your answer has two terms? no points

- ◯ yes → ◯ **1 pt** one term is $15x^4\dfrac{dx}{dy}$; ◯ **1 pt** the other term is 4 (only with the line above)
- ◯ no → **0 points, unless your answer can be re-expressed as** $15x^4\dfrac{dx}{dy}+4$

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

NO

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

- ◯ no
- ◯ yes → **Your answer has:**
  - ◯ no $+4$
  - ◯ $\left(\dfrac{dx}{dy}\right)^4$

4(b)

points _____ / 2

ANSWER

$$-2x\sin(x^2)\frac{dx}{dy}$$

◯ **1 pt** has $\sin(x^2)$ times $\frac{dx}{dy}$

◯ **1 pt** your whole answer matches one of: $-2x\sin(x^2)\frac{dx}{dy}$, $-\sin(x^2)\cdot 2x\cdot\frac{dx}{dy}$

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

NO ↓

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

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

5(a)

points _____ / 3

ANSWER

4

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

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

NO ↓

Your answer:

- ◯ 2 → **In your work, the number inside $f'(\ \ )$ is:**
  - ◯ -3
  - ◯ 1
  - ◯ 2
  - ◯ no f' written
- ◯ another number

5(b)

points _____ / 3

ANSWER

-2

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

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

NO

Your answer:

- ◯ 2 → **In your work, the number inside $f'(\ \ )$ is:**
  - ◯ 1
  - ◯ 2
  - ◯ no f' written
- ◯ none: needed $g'(2)$, a corner of g
- ◯ another number

6(a)

points _____ / 3

ANSWER

-8

◯ **1 pt** $g(1) = 3$
◯ **1 pt** $f'(3) = -2$ and $g'(1) = 4$
◯ **1 pt** answer -8

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

NO

Your answer:

- ◯ 12
- ◯ none: $f'(4)$ not in table
- ◯ another number

6(b)

points _____ / 3

ANSWER

15

◯ **1 pt** $k'(2) = 3[g(2)]^2 \cdot g'(2)$
◯ **1 pt** $g(2) = -1$ and $g'(2) = 5$
◯ **1 pt** answer 15

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

NO

Your answer:

- ◯ 3
- ◯ 75
- ◯ another number

6(c)

points _____ / 2

ANSWER

4

◯ **2 pts** answer $= 4$

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

NO

Your answer:

- ◯ -8
- ◯ 2
- ◯ another number