Error-checking worksheet

Find the first wrong line, or write "no error". Explain and repair the derivative.
All angles are in radians. x^2 means x squared; * means multiplication.

1. A power of a polynomial

Domain: all real x

```
f(x) = (2x^3 - 5)^4
  1. u = 2x^3 - 5;  f(x) = u^4
  2. f'(x) = 4u^3
  3. f'(x) = 4(2x^3 - 5)^3
```

First error (or none): _____ Reason / corrected derivative:

---

2. A trigonometric composition

Domain: all real x

```
f(x) = sin(3x^2 + 1)
  1. u = 3x^2 + 1;  du/dx = 6x
  2. f'(x) = cos(u) * 6x
  3. f'(x) = 6x cos(3x^2 + 1)
```

First error (or none): _____ Reason / corrected derivative:

---

3. A product

Domain: all real x

```
f(x) = x^2 cos(x)
  1. u = x^2;  v = cos(x)
  2. f'(x) = u'v'
  3. f'(x) = -2x sin(x)
```

First error (or none): _____ Reason / corrected derivative:

---

4. An exponential factor

Domain: all real x

```
f(x) = x e^(2x)
  1. u = x;  v = e^(2x)
  2. u' = 1;  v' = e^(2x)
  3. f'(x) = e^(2x) + x e^(2x)
```

First error (or none): _____ Reason / corrected derivative:

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Error-checking worksheet

Keep the stated domain. Do not assume every example contains an error.
For the final note, ask for clarification before selecting a derivative.

5. A quotient

Domain: x != 2

```
f(x) = (x^2 + 1) / (x - 2)
  1. u = x^2 + 1;  v = x - 2
  2. f'(x) = (u'v - uv') / v
  3. f'(x) = [2x(x - 2) - (x^2 + 1)] / (x - 2)
```

First error (or none): _____ Reason / corrected derivative:

---

6. Check before correcting

Domain: all real x

```
f(x) = (3x + 2) / (x^2 + 1)
  1. u = 3x + 2; v = x^2 + 1; u' = 3; v' = 2x
  2. f'(x) = [3(x^2 + 1) - (3x + 2)2x] / (x^2 + 1)^2
  3. f'(x) = (-3x^2 - 4x + 3) / (x^2 + 1)^2
```

First error (or none): _____ Reason / corrected derivative:

---

7. The rule or the algebra?

Domain: x != -1

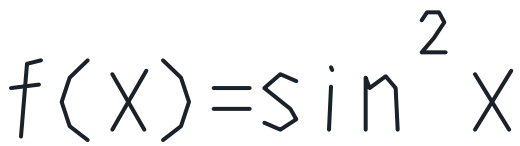
```
f(x) = (x^2 - 4) / (x + 1)
  1. u = x^2 - 4; v = x + 1; u' = 2x; v' = 1
  2. f'(x) = [2x(x + 1) - (x^2 - 4)] / (x + 1)^2
  3. f'(x) = (x^2 + 2x - 4) / (x + 1)^2
```

First error (or none): _____ Reason / corrected derivative:

---

8. When the source is unclear

The copied exponent placement is unclear.



Ask the writer to clarify. Give both possible readings and conditional derivatives; do not choose one.

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