MATH 118: Quiz 2

Name: key

Directions:

- Show your thought process (commonly called "showing your work") when solving each problem for full credit.
- If you do not know how to solve a problem, try your best and/or explain in English what you would do.
- Good luck!

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1. Simplify: $\dfrac{x \cdot \sqrt[3]{(x-1)^4}}{\sqrt[3]{(x-1)^2}}$

$$= \frac{x \cdot (x-1)^{\frac{4}{3}}}{(x-1)^{\frac{2}{3}}}$$

$$= x \cdot (x-1)^{\frac{4}{3} - \frac{2}{3}}$$

$$= \boxed{x\,(x-1)^{\frac{2}{3}}}$$

terms are subproblems. Deal with them independently first!

2. Expand: $2xh - 2(x+h)^2$ (T T)

$$= 2xh - 2\left(x^2 + 2xh + h^2\right)$$

$(x+h)^2$ used $(A+B)^2 = A^2 + 2AB + B^2$

$$= 2xh - 2x^2 - 4xh - 2h^2 \quad \text{dist law.}$$

$$= \boxed{-2x^2 - 2xh - 2h^2}$$

3. Completely factor: $4x^2 - 4x - 3$

$a = 4, \quad b = -4, \quad c = -3$

For a:

4	1	2
1	4	2

For c:

3	-1	-3	1
-1	3	1	-3

Try to make a diagonal product close to b.

$(1 \quad -3) \rightarrow -12$ bad choice.

$(4 \quad 1)$

$(2 \quad -3) \rightarrow 2 \cdot 1 + 2 \cdot (-3) = -4$

$(2 \quad 1)$

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

4. Completely factor: $x^{99} - x^{97}$

Two term. GCF first.

$x^{99} - x^{97} = x^{97}(x^2 - 1)$ now use $A^2 - B^2$

$A = x, \quad B = 1$

$$= x^{97}(x-1)(x+1)$$