

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

**DIRECTIONS:** For #1-12, simplify. Show work. No answer should use negative or zero exponents.

1.  $\frac{21x^4}{49x}$

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2.  $\frac{y^{4+k}}{y^{2+k}}$

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3.  $\frac{(3a^2b)^3}{(9ab^2)^2}$

\_\_\_\_\_

4.  $\frac{(xy^2z^3)^2}{(x^3y^2z)^3}$

\_\_\_\_\_

5.  $\frac{(3ab^2)^2}{bc} \cdot \left(\frac{c^2}{ab}\right)^2$

\_\_\_\_\_

6.  $-(8n)^0$

\_\_\_\_\_

$$7. \frac{5p^{-1}q^{-1}}{p}$$

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$$8. \frac{(c^{-1}d^2)^3}{(cd)^{-1}}$$

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$$9. \left(\frac{m^{-1}n^{-1}}{p}\right)^2 \cdot \left(\frac{m^2}{n^{-3}p^{-1}}\right)^{-1}$$

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$$10. (8^{-1}xy^{-1})^2 \cdot (2xy^{-1})^{-3}$$

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$$11. \frac{(4a^4b^3)^2}{-32a^2b^5}$$

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$$12. (-2^{-4})^{-1}$$

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DIRECTIONS: For #13-18, simplify. Show work.

**13.**  $\frac{16x^2-25}{8x+10}$

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**14.**  $\frac{4mn^2+4mn}{4mn^2-4mn}$

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**15.**  $\frac{5a-5b}{5b-5a}$

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**16.**  $\frac{2c^3-2d^3}{7c^2+7cd+7d^2}$

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**17.**  $\frac{w^2-14w+49}{w^2-7w}$

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**18.**  $(p^2 + 3p - 10)(p - 2)^{-2}$

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DIRECTIONS: For #19-20, use the following function. Show work.

$$f(x) = \frac{x^2 + 2x - 3}{2x^2 + 6x}$$

**19.** Find the **domain** of the function

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**20.** Find the **zeros** (if any) of the function

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