Precalculus Practice A.APR.D.7: Multiplication and Division of Rationals

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Multiply:

1. $\frac{x^2}{x+2} \cdot \frac{x^2-5x-14}{x^2+2x}$

[A] x [B] $\frac{-5x-14}{4x}$

[C] $\frac{x^2-7x}{x+2}$ [D] $\frac{x^2+7x}{x+2}$

2. $\frac{x^2}{x+5} \cdot \frac{x^2-x-30}{x^2-6x}$

[A] $\frac{x^2+6x}{x-6}$ [B] $\frac{-x-30}{-30x}$

[C] x [D] $\frac{x^2-6x}{x-6}$

3. $\frac{x^2}{x+9} \cdot \frac{x^2+6x-27}{x^2-3x}$

[A] x [B] $\frac{6x-27}{-27x}$

[C] $\frac{x^2-3x}{x-3}$ [D] $\frac{x^2+3x}{x-3}$

4. What is the product of $\frac{x^2-x-6}{x^2-3x+2} \cdot \frac{2x^2-6x+4}{x^2-2x-3}$?

[A] $\frac{2x+4}{x+1}$ [B] $\frac{x+2}{x+1}$

[C] 6 [D] $\frac{2x+4}{x-1}$

Multiply:

5. $\frac{x^2}{x+8} \cdot \frac{x^2+x-56}{x^2-7x}$

6. $\frac{x^2}{x+4} \cdot \frac{x^2-2x-24}{x^2-6x}$

7. $\frac{x^2}{x-9} \cdot \frac{x^2-4x-45}{x^2-4x}$

8. $\frac{x^2}{x+3} \cdot \frac{x^2+5x+6}{x^2+2x}$

9. Compare the quantities in Column A and Column B.

Column A	Column B
$\frac{-3x-6}{x+2}$	$-6x \cdot \frac{3x}{6x^2}$

[A] The quantity in Column A is greater.

[B] The quantity in Column B is greater.

[C] The quantities are equal.

[D] The relationship cannot be determined from the information given.

10. Explain why the simplified form of $\frac{x-8}{4} \cdot \frac{3}{8-x}$ is $-\frac{3}{4}$.

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Divide:

11. $\frac{x^2+11x+28}{x^2-16} \div \frac{x+7}{x-7}$

[A] $\frac{x-7}{x-4}$ [B] $\frac{x-9}{x-4}$

[C] $\frac{x+4}{x-7}$ [D] $\frac{11x+7}{4}$

12. $\frac{x^2+9x+20}{x^2-25} \div \frac{x+4}{x-4}$

[A] $\frac{x+5}{x-4}$ [B] $\frac{9x+4}{5}$

[C] $\frac{x-9}{x-5}$ [D] $\frac{x-4}{x-5}$

13. $\frac{x^2-1}{x+5} \div (x+1)$

[A] $\frac{x-1}{x+5}$ [B] $\frac{x+5}{x-1}$

[C] $\frac{(x+1)(x-1)}{x+5}$ [D] $\frac{x+1}{x+5}$

14. $\frac{x^2-64}{x-4} \div (x+8)$

[A] $\frac{x+8}{x-4}$ [B] $\frac{(x+8)(x-8)}{x-4}$

[C] $\frac{x-4}{x-8}$ [D] $\frac{x-8}{x-4}$

15. $\frac{x+1}{x-1} \div \frac{x^2-1}{1-x}$

[A] $\frac{x+1}{x-1}$ [B] $\frac{1}{x-1}$

[C] $\frac{1}{1-x}$ [D] $\frac{1}{3-x}$

16. What is the quotient $\frac{y-5}{20} \div \frac{5-y}{25}$?

[A] -0.002 [B] -0.8 [C] 1.25

[D] -1.25 [E] 0.8

Divide:

17. $\frac{x^2-81}{x+3} \div (x-9)$

18. $\frac{x+2}{x-2} \div \frac{x^2-4}{2-x}$

19. $\frac{x+5}{x-5} \div \frac{x^2-25}{5-x}$

20. Find two rational expressions that can be divided to give the quotient $\frac{x-3}{x+1}$.

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[1] C

[2] C

[3] A

[4] A

[5] x

[6] x

[7] $\frac{x^2+5x}{x-4}$

[8] x

[9] C

[10] The quotient of $x-8$ and $8-x$ is -1 and there are no other common factors, so the simplified form is $-\frac{3}{4}$.

[11] A

[12] D

[13] A

[14] D

[15] C

[16] D

[17] $\frac{x+9}{x+3}$

[18] $\frac{1}{2-x}$

[19] $\frac{1}{5-x}$

[20] Answers may vary. Sample: $\frac{x^2+x-12}{x^2+2x+1} \div \frac{x+4}{x+1}$