

Operations with rational expressions



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1. Simplify the following expression:

$$\frac{-2p + 8}{2p + 2}$$

A. $\frac{-p+8}{p+2}$

B. $\frac{-p+4}{2p+2}$

C. $\frac{-p+4}{p+1}$

D. $\frac{p+4}{p+1}$

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2.Simplify the following expression:

$$\frac{-24r^2 - 56r}{-48r^2 + 64r}$$

- A. $\frac{-3r+7}{-6r+8}$
B. $\frac{-3r-7r}{-6r+8r}$
C. $\frac{3r+7}{-6r+8}$
D. $\frac{-3r-7}{-6r+8}$

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3.Simplify the following expression:

$$\frac{-50z^2 + 35z}{-45z^2 + 40z}$$

You can assume $z \neq 0$.

- A. $\frac{-10z+7}{-9z+8}$
B. $\frac{10z+7}{9z+8}$
C. $\frac{-10z+7}{-9z-8}$
D. $\frac{-10z+35}{-9z+40}$

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$$4. \frac{2k}{3k+12} + \frac{k+7}{k^2+4k}$$

Which expression is equivalent to the above sum?

- A. $\frac{2k^2+3k+21}{3k^2+12k}$
- B. $\frac{2k^2+14k}{3k^3+24k^2+48}$
- C. $\frac{3k+7}{k^2+7k+12}$
- D. $\frac{3k+7}{k+4}$

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5. $\frac{49m^4n - 21m^6n^2}{7m^2n^4}$

Which expression is equivalent to the above for all $m > 1$ and $n > 1$?

A. $7m^2n^4 - 3m^4n^2$

B. $7m^2n^3 - 3m^4n^2$

C. $\frac{7m^2 - 3m^3}{n^2}$

D. $\frac{7m^2 - 3m^4n}{n^3}$

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$$6. \frac{4k^2 - 12k + 9}{2k^2 + 19k - 33} \cdot \frac{k^2 + 8k - 33}{k^2 - 3k}$$

Which expression is equivalent to the above product for $k \geq 33$?

A. $\frac{2k-3}{k}$

B. $\frac{8(4k^2+13)}{(2k+9)}$

C. $\frac{(2k^2+9)(2k^2-33)}{4k^4-57k^2-33}$

D. $\frac{2k^4+20k^3-73k^2+53k-297}{k(k^3+13k^2-30k+11)}$

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$$7. \frac{5m^2+7m}{2m-9} - \frac{2m}{2m-9}$$

Which expression is equivalent to the above difference?

- A. $\frac{3m^2+7m}{2m-9}$
- B. $\frac{5m^2+5m}{2m-9}$
- C. $\frac{5m+9m}{2m-9}$
- D. $\frac{5m^2+7m-1}{2m-9}$

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$$8.\frac{5x}{6y} \cdot \frac{3}{10y}$$

Which expression is equivalent to the above product for all $y > 0$?

- A. $\frac{x}{2}$
- B. $\frac{25x}{9}$
- C. $\frac{x}{2y^2}$
- D. $\frac{x}{4y^2}$

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$$9. \frac{3g^2+12g}{g+7} \cdot \frac{4}{8g^2}$$

Which expression is equivalent to the above product for all $g > 0$?

- A. $\frac{3g+48}{g^2+56g}$
- B. $\frac{12g+12}{8g^2+7g}$
- C. $\frac{3g+12}{2g^2+14g}$
- D. $\frac{3g+12}{2g+14}$

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$$10. \frac{r^2 + 14r + 49}{r^2 + 15r + 56}$$

Which expression is equivalent to the following expression, for all $r > 0$?

- A. $\frac{14r + 49}{15r + 56}$
- B. $\frac{14 + 7}{15 + 8}$
- C. $\frac{r + 7}{r + 8}$
- D. $\frac{49}{r + 56}$

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11. $\frac{8v}{28w+21} - \frac{3v+10}{4w+3}$

Which expression is equivalent to the above difference?

A. $\frac{8v^2-21v+10}{24w+18}$

B. $\frac{-13v+10}{24w+18}$

C. $\frac{53v+10}{28w+21}$

D. $\frac{-13v-70}{28w+21}$

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$$\frac{\left(\frac{l^5 n^2}{l^7 n}\right)}{\left(\frac{l^3 n^9}{ln^3}\right)}$$

12. Which expression is equivalent to the above quotient for all $l < -2$ and $n > 4$?

- A. 0
- B. 1
- C. $l^4 n^5$
- D. $\frac{1}{l^4 n^5}$

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$$\frac{\left(\frac{-x^2 - 2x + 3}{x^3 - 3x^2 + 2x}\right)}{\left(\frac{3x^2 + 24x + 45}{5x^2 + 25x}\right)}$$

13. Which expression is equivalent to the above quotient for all $x > 10$?

- A. $\frac{-5}{3x-6}$
- B. $\frac{-5}{3x+9}$
- C. $\frac{-5x^2+10x+15}{3x^3-21x+18}$
- D. $\frac{-3x^2-18x-27}{5x^3-10x^2}$

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$$\frac{5m}{m^2 - 24mn + 144n^2} + \frac{2n}{m^2 - 144n^2}$$

14. Which expression is equivalent to the above sum?

- A. $\frac{5m^2 + 60mn + 2n^2}{(m - 12n)(m + 12n)}$
- B. $\frac{5m^2 + 62mn - 24n^2}{(m - 12n)^2(m + 12n)}$
- C. $\frac{5m - 24mn + 2n}{(m - 12n)(m - 12n)}$
- D. $\frac{5m^2 - 58mn + 24n^2}{(m - 12n)(m + 12n)^2}$

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$$15. \frac{3}{x^2 - x - 20} + \frac{1}{x^2 + 9x + 20}$$

Which expression is equivalent to the above sum for all $x > 5$?

- A. $\frac{4}{2x^2 + 8x}$
- B. $\frac{4x + 10}{(x^2 - 25)(x + 4)}$
- C. $\frac{4x + 10}{(x - 5)^2(x + 4)}$
- D. $\frac{4x + 8}{(x^2 - 16)(x + 5)}$

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