

Gateway Exam #1 Practice Problems
Working with Fractions

1. A common denominator of $\frac{1}{x}$ and $\frac{x}{4}$ is:
 - (a) $x + 4$
 - (b) x
 - (c) 4
 - (d) $4x$
 - (e) $x + 1$

2. A common denominator of $\frac{a+1}{b}$ and $\frac{1}{ab}$ is:
 - (a) a
 - (b) b
 - (c) $a + 2$
 - (d) $a^2 + ab$
 - (e) ab

3. A common denominator of $\frac{x}{1}$ and $\frac{1}{x^2}$ is:
 - (a) $1 + x^2$
 - (b) x^2
 - (c) $x^3 + 1$
 - (d) 1
 - (e) $(1 - x)(1 + x)$

4. A common denominator of $\frac{3}{4}$ and $\frac{1}{4(x+1)^2}$ is:
 - (a) $4(1+x)^2$
 - (b) $5 + x^2$
 - (c) $x^2 + 4x + 4$
 - (d) $4x^2 + 4$
 - (e) $(x+1)^2$

5. A common denominator of $\frac{x}{x+1}$ and $\frac{x+1}{x}$ is:
 - (a) $x^2 + 1$
 - (b) $x(x+1)$

- (c) $2x + 1$
- (d) x^2
- (e) $(x + 1)^2$

6. If you reduced the expression $\frac{1}{x} + \frac{x}{x+1}$ to a single fraction you could obtain:

- (a) $\frac{x+1}{2x+1}$
- (b) $\frac{3}{2}$
- (c) $\frac{x^2+x+1}{x(x+1)}$
- (d) $\frac{2}{3}$
- (e) $\frac{x^2}{x+1}$

7. If you reduced the expression $\frac{a}{b} + \frac{b}{a}$ to a single fraction you could obtain:

- (a) 1
- (b) 2
- (c) $\frac{a+b}{ab}$
- (d) $\frac{a^2+b^2}{3}$
- (e) $\frac{ab}{a+b}$

8. If you reduced the expression $\frac{1}{2} + \frac{1}{a}$ to a single fraction you could obtain:

- (a) $\frac{1}{2a}$
- (b) $\frac{2}{a}$
- (c) $\frac{1}{2+a}$
- (d) $\frac{2}{2+a}$
- (e) $\frac{a+2}{2a}$

9. If you reduced the expression $\frac{1}{x^2} + \frac{x^2}{x+1}$ to a single fraction you could obtain:

- (a) $\frac{x^4 + x + 1}{x^2(x + 1)}$
- (b) $\frac{1 + x^2}{x^2(x + 1)}$
- (c) $\frac{x^2 + x + 1}{x(x + 1)}$
- (d) $\frac{1 + x^2}{x^2 + x + 1}$
- (e) $\frac{x^2}{x + 1}$

10. If you reduced the expression $\frac{a^2}{3} + \frac{3}{a}$ to a single fraction you could obtain:

- (a) a
- (b) $\frac{a^3 + 9}{3a}$
- (c) $\frac{3a^2}{3 + a}$
- (d) $\frac{a^2 + 3}{3 + a}$
- (e) $\frac{a^2 + 3}{3a}$

11. If you reduced the expression $a - \frac{1}{a}$ to a single fraction you could obtain:

- (a) $\frac{a - 1}{a}$
- (b) $\frac{1 - a}{a^2}$
- (c) $\frac{a^2 - 1}{a}$
- (d) $\frac{1}{a^2}$
- (e) The given quantities cannot be combined into a single fraction.

12. If you reduced the expression $\frac{1}{x} - \frac{1}{x + 1}$ to a single fraction you could obtain:

- (a) 0
- (b) $\frac{0}{-1}$
- (c) $\frac{x^2 - 1}{x(x + 1)}$

(d) $\frac{1}{-1}$

(e) $\frac{1}{x(x+1)}$

13. If you reduced the expression $\frac{2}{x+1} - \frac{1}{x+1}$ to a single fraction you could obtain:

(a) $\frac{1}{2x+2}$

(b) $\frac{1}{0}$

(c) $\frac{x^2+x+1}{x+1}$

(d) $\frac{1}{x+1}$

(e) $\frac{2x^2+2}{x+1}$

14. If you reduced the expression $\frac{x+1}{x} - \frac{2}{x+1}$ to a single fraction you could obtain:

(a) $\frac{x^2+1}{x(x+1)}$

(b) $\frac{x-1}{x(x+1)}$

(c) $\frac{x^2+x+1}{x(x+1)}$

(d) $\frac{x^2+2x-1}{x(x+1)}$

(e) $\frac{x}{x+1}$

15. If you reduced the expression $\frac{a^2}{b} - \frac{b}{a}$ to a single fraction you could obtain:

(a) $\frac{a^2-b}{b-a}$

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

(c) $\frac{a^2-b}{ab}$

(d) $\frac{a^2b}{b-a}$

(e) $\frac{a^2+b}{b-a}$

16. If you reduced the expression $\frac{1}{x} \cdot \frac{x}{x+1}$ to a single fraction you could obtain:

(a) $\frac{x}{2x+1}$

(b) $\frac{2x}{x+1}$

(c) $\frac{1}{x+1}$

(d) $\frac{1}{x^2+1}$

(e) $\frac{x^2}{x+1}$

17. If you reduced the expression $\frac{a^3}{1+b} \cdot \frac{1+b}{a^6}$ to a single fraction you could obtain:

(a) $\frac{(1+b)^2}{a^3}$

(b) $\frac{1}{a^3}$

(c) $\frac{a^3}{(1+b)^2}$

(d) $\frac{a^9}{(1+b)^2}$

(e) $\frac{a^3+b+1}{a^6+b+1}$

18. If you reduced the expression $\frac{\sqrt{x}}{x} \cdot \frac{x}{\sqrt{x}+1}$ to a single fraction you could obtain:

(a) $\frac{x+\sqrt{x}}{x+\sqrt{x}+1}$

(b) $\frac{x^{3/2}}{x^{3/2}+1}$

(c) $\frac{x+\sqrt{x}}{x(\sqrt{x}+1)}$

(d) $1 + \frac{1}{\sqrt{x}}$

(e) $\frac{\sqrt{x}}{\sqrt{x}+1}$

19. If you reduced the expression $\frac{x-1}{x+1} \cdot \frac{x}{x+1}$ to a single fraction you could obtain:

(a) $\frac{x}{2x+2}$

- (b) $\frac{2x - 1}{2x + 1}$
- (c) $\frac{x^2 + x + 1}{x(x + 1)}$
- (d) $\frac{x^2 - x}{(x^2 + 1)^2}$
- (e) $\frac{x}{x + 1}$

20. If you reduced the expression $\frac{1}{x - 1} \cdot \frac{x^2}{x + 1}$ to a single fraction you could obtain:

- (a) $\frac{x^2}{x^2 - 1}$
- (b) $\frac{x^2 + 1}{x^2 - 1}$
- (c) $\frac{1 + x}{x^2 - 1}$
- (d) $\frac{x^2 - 1}{x + 1}$
- (e) $\frac{x^2}{x + 1}$

21. If you reduced the expression $\frac{\frac{1}{x}}{x}$ to a single fraction you could obtain:

- (a) $\frac{1}{2x}$
- (b) x^2
- (c) 1
- (d) $\frac{1}{x^2}$
- (e) $\frac{x^2}{x + 1}$

22. If you reduced the expression $\frac{\frac{a}{b}}{\frac{a}{b}}$ to a single fraction you could obtain:

- (a) $\frac{a^2}{b^2}$
- (b) $\frac{2a}{b}$
- (c) $\frac{a}{b}$
- (d) a^2b^2
- (e) 1

23. If you reduced the expression $\frac{x^2}{\frac{1}{x}}$ to a single fraction you could obtain:

(a) x^3

(b) $\frac{1}{x^3}$

(c) x

(d) $\frac{1}{x}$

(e) $\frac{x^2}{x+1}$

24. If you reduced the expression $\frac{\frac{x+1}{x}}{x}$ to a single fraction you could obtain:

(a) $\frac{x+1}{2x}$

(b) $1 + \frac{1}{x}$

(c) $\frac{x+1}{x^2}$

(d) 2

(e) $\frac{2}{x}$

25. If you reduced the expression $\frac{1+x}{\frac{1}{x^2}}$ to a single fraction you could obtain:

(a) $\frac{x+1}{2x+1}$

(b) $x^2 + x^3$

(c) $\frac{x^2 + x + 1}{x + 1}$

(d) $\frac{2x^2}{1+x}$

(e) $\frac{x}{x^2 + x^3}$

26. Simplifying the expression $\frac{x^3 - 3x^2}{x}$ could produce:

(a) $x^2 - 3x$

(b) $x^2 - 3x^2$

(c) $-2x^2$

(d) $x^3 - 3x$

(e) $\frac{x}{x^3 - 3x^2}$

27. Simplifying the expression $\frac{\sqrt{x}(x-1)}{x^2-1}$ could produce:

(a) $x^{3/2} + 1$

(b) $x^2 - 1$

(c) $\frac{1}{x+1}$

(d) $\frac{\sqrt{x}}{x+1}$

(e) $\frac{1}{\sqrt{x}-1}$

28. Simplifying the expression $\frac{x^3}{x+x^2}$ could produce:

(a) 1

(b) $\frac{x}{1+x}$

(c) x^2

(d) $\frac{1}{x} + x$

(e) $\frac{x^2}{1+x}$

29. Simplifying the expression $\frac{\frac{1}{x} + x}{x}$ could produce:

(a) $\frac{1}{x} + 1$

(b) $\frac{1+x^2}{x}$

(c) $\frac{1}{x^2} + x$

(d) $x^2 + 1$

(e) $\frac{1}{x^2} - 1$

30. Simplifying the expression $\frac{\sqrt{x} + x}{\sqrt{x}}$ could produce:

(a) $1 + x$

(b) $2\sqrt{x}$

(c) $1 + \sqrt{x}$

(d) $x^2 + 1$

(e) $x + \frac{1}{\sqrt{x}}$

Answers:

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|-------|-------|-------|-------|-------|
| 1. d | 2. e | 3. b | 4. a | 5. b |
| 6. c | 7. d | 8. e | 9. a | 10. b |
| 11. c | 12. e | 13. d | 14. a | 15. b |
| 16. c | 17. b | 18. e | 19. d | 20. a |
| 21. d | 22. e | 23. a | 24. c | 25. b |
| 26. a | 27. d | 28. e | 29. b | 30. c |