Gateway Exam #1 Practice Problems
Working with Fractions

1. A common denominator of $\dfrac{1}{x}$ and $\dfrac{x}{4}$ is:

 (a) $x + 4$

 (b) x

 (c) 4

 (d) $4x$

 (e) $x + 1$

2. A common denominator of $\dfrac{a+1}{b}$ and $\dfrac{1}{ab}$ is:

 (a) a

 (b) b

 (c) $a + 2$

 (d) $a^2 + ab$

 (e) ab

3. A common denominator of $\dfrac{x}{1}$ and $\dfrac{1}{x^2}$ is:

 (a) $1 + x^2$

 (b) x^2

 (c) $x^3 + 1$

 (d) 1

 (e) $(1 - x)(1 + x)$

4. A common denominator of $\dfrac{3}{4}$ and $\dfrac{1}{4(x+1)^2}$ 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 $\dfrac{x}{x+1}$ and $\dfrac{x+1}{x}$ 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 $\dfrac{1}{x} + \dfrac{x}{x + 1}$ to a single fraction you could obtain:

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

(b) $\dfrac{3}{2}$

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

(d) $\dfrac{2}{3}$

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

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

(a) 1

(b) 2

(c) $\dfrac{a + b}{ab}$

(d) $\dfrac{a^2 + b^2}{ab}$

(e) $\dfrac{ab}{a + b}$

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

(a) $\dfrac{1}{2a}$

(b) $\dfrac{2}{a}$

(c) $\dfrac{1}{2 + a}$

(d) $\dfrac{2}{2 + a}$

(e) $\dfrac{a + 2}{2a}$

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

(a) $\dfrac{x^4 + x + 1}{x^2(x+1)}$

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

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

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

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

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

(a) a

(b) $\dfrac{a^3 + 9}{3a}$

(c) $\dfrac{3a^2}{3+a}$

(d) $\dfrac{a^2 + 3}{3+a}$

(e) $\dfrac{a^2 + 3}{3a}$

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

(a) $\dfrac{a-1}{a}$

(b) $\dfrac{1-a}{a^2}$

(c) $\dfrac{a^2 - 1}{a}$

(d) $\dfrac{1}{a^2}$

(e) The given quantities cannot be combined into a single fraction.

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

(a) 0

(b) $\dfrac{0}{-1}$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(b) $\dfrac{2x-1}{2x+1}$

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

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

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

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

(a) $\dfrac{x^2}{x^2-1}$

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

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

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

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

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

(a) $\dfrac{1}{2x}$

(b) x^2

(c) 1

(d) $\dfrac{1}{x^2}$

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

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

(a) $\dfrac{a^2}{b^2}$

(b) $\dfrac{2a}{b}$

(c) $\dfrac{a}{b}$

(d) a^2b^2

(e) 1

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

   (a) x^3

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

   (c) x

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

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

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

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

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

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

   (d) 2

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

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

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

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

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

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

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

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

   (a) $x^2 - 3x$

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

   (c) $-2x^2$

   (d) $x^3 - 3x$

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

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

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

(b) $x^2 - 1$

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

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

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

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

(a) 1

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

(c) x^2

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

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

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

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

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

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

(d) $x^2 + 1$

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

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

(a) $1 + x$

(b) $2\sqrt{x}$

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

(d) $x^2 + 1$

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

Answers:

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