

Math142 Algebra Review

1. Which of the following is equivalent to $\frac{5-3a}{\frac{1}{2} + \frac{2}{a}}$?

(a) $\frac{20-7a-3a^2}{2}$ (b) $\frac{10a-6a^2}{a+4}$ (c) $\frac{5a-3a^2}{a+2}$ (d) $\frac{10a+6a^2}{a-2}$ (e) $5a-3a^2$
2. Which of the following is equivalent to $\frac{6z^5}{30z^{n+2}}$.

(a) $\frac{1}{5}z^{7-n}$ (b) $\frac{1}{5}z^{n+7}$ (c) $\frac{1}{5}z^{3-n}$ (d) $\frac{1}{5}z^{n+3}$ (e) $\frac{1}{5}z^{\frac{5}{n+2}}$
3. Given that $\frac{1}{a} + \frac{1}{b} = 4$ and $\frac{1}{a} - b = 6$, then $a =$

(a) $\frac{1}{10}$ (b) 10 (c) 5 (d) $\frac{1}{5}$ (e) -1
4. $\sqrt{80}\sqrt{\frac{x}{5}}$

(a) $4\sqrt{x}$ (b) $2\sqrt{x}$ (c) $4x$ (d) $16\sqrt{x}$ (e) $2x$
5. If $4^y = \frac{2^{1/2}}{\sqrt{8}}$, then $y =$

(a) 2 (b) -2 (c) $\frac{-1}{2}$ (d) $\frac{1}{2}$ (e) 1
6. Find all values of x that satisfy $|3-2x| \leq 5$

(a) \Re (b) $x \geq -1$ (c) $-1 \leq x \leq 4$ (d) ϕ (e) $-1 \geq x \geq 4$
7. What is the distance between the two points $(5, 4)$ and $(-2, 3)$?

(a) $5\sqrt{2}$ (b) 10 (c) $\sqrt{58}$ (d) 8 (e) 5
8. Suppose that $x + y = -2$ and $x - 2y = -8$. Then $x - y =$

(a) 0 (b) 4 (c) -2 (d) -6 (e) -4
9. If $g(x) = (x-1)^2$ and $f(x) = 3x+2$, then $(g \circ f)(x) =$

(a) $9x^2 + 1$ (b) $9x^2 + 6x + 1$ (c) $3x^2 - 6x + 5$ (d) $3x^2 + 5$ (e) $6x^2 + 1$
10. A water tank is initially $\frac{1}{5}$ full. After adding 22 gallons of water, it is $\frac{3}{4}$ full. What is the capacity of the tank in gallons?

(a) 50 (b) 40 (c) 30 (d) 25 (e) 60
11. The slope of the line having equation $x = -2y + 5$ is

(a) $\frac{-1}{2}$ (b) 2 (c) $\frac{1}{2}$ (d) -2 (e) -1
12. Simplify: $\sqrt{50} + \sqrt{8}$

(a) $2\sqrt{15}$ (b) 14 (c) $\sqrt{60}$ (d) $10\sqrt{2}$ (e) $7\sqrt{2}$
13. The domain of the function $f(x) = \frac{x^2 - x - 2}{x^2 - 2x - 3}$ is

(a) $\Re, x \neq 3, -1$ (b) $\Re, x \neq 3$ (c) $\Re, x \neq 3, 2$ (d) $\Re, x \neq 2, 3, -1$ (e) \Re

14. Which of the following equals $(x^2 - 3x + 2)^2$?

- (a) $x^4 + 9x^3 - 13x^2 + 12x + 4$ (b) $x^4 - 6x^3 - 5x^2 - 12x + 4$ (c) $x^4 + 9x^2 + 4$
(d) $x^4 - 6x^3 + 13x^2 - 12x + 4$ (e) $x^4 - 6x^3 + 10x^2 - 12x + 4$

15. The perimeter of a rectangle is eight times its width. If the length of the rectangle is 60 inches, what is its width in inches?

- (a) 40 (b) 20 (c) 10 (d) 180 (e) 120

16. Which of the following is equivalent to $\frac{2x^2 - 7x - 4}{3x^2 - 14x + 8}$?

- (a) $\frac{2x - 4}{3x + 8}$ (b) $\frac{2x + 4}{3x - 8}$ (c) $\frac{2x + 1}{3x - 2}$ (d) $\frac{2x - 1}{3x + 2}$ (e) $\frac{2}{3}x^2 + \frac{1}{2}x - \frac{1}{2}$

17. Factor: $6x^2 + 13x + 6$

- (a) $(6x + 6)(x + 1)$ (b) $(3x + 2)(2x + 3)$ (c) $(2x + 2)(3x + 3)$
(d) $(3x + 2)(3x + 2)$ (e) $(6x + 1)(x + 6)$

18. Expand: $(e^x - e^{-x})(e^x + e^{-x})$

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

19. Simplify: $\frac{x-1}{2} - \frac{x}{3}$

- (a) $\frac{2x-3}{6}$ (b) $\frac{x-3}{6}$ (c) $\frac{-1}{6}$ (d) $\frac{x-1}{2}$ (e) $\frac{x-1}{6}$

20. Simplify: $64^{\frac{-2}{3}}$

- (a) 512 (b) $\frac{1}{16}$ (c) 16 (d) $\frac{1}{512}$ (e) $-\frac{1}{512}$