Math142 Algebra Review

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

(a) $\dfrac{20-7a-3a^2}{2}$ **(b)** $\dfrac{10a-6a^2}{a+4}$ (c) $\dfrac{5a-3a^2}{a+2}$ (d) $\dfrac{10a+6a^2}{a-2}$ (e) $5a-3a^2$

2. Which of the following is equivalent to $\dfrac{6z^5}{30z^{n+2}}$.

(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 $\dfrac{1}{a}+\dfrac{1}{b}=4$ and $\dfrac{1}{a}-b=6$, 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 $4^y=\dfrac{2^{1/2}}{\sqrt{8}}$, then $y=$

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

6. Find all values of x that satisfy $\mid 3-2x \mid \leq 5$

(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 $f(x)=\dfrac{x^2-x-2}{x^2-2x-3}$ 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 $\dfrac{2x^2 - 7x - 4}{3x^2 - 14x + 8}$?

(a) $\dfrac{2x-4}{3x+8}$ (b) $\dfrac{2x+4}{3x-8}$ [(c)] $\dfrac{2x+1}{3x-2}$ (d) $\dfrac{2x-1}{3x+2}$ (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: $\dfrac{x-1}{2} - \dfrac{x}{3}$

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

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

(a) 512 [(b)] $\dfrac{1}{16}$ (c) 16 (d) $\dfrac{1}{512}$ (e) $-\dfrac{1}{512}$