

1. (R4) Simplify:  $(x^2 - 3x + 1) - (2x - 5)$ 
  - (a)  $-2x^3 + 11x^2 - 17x + 5$
  - (b)  $x^2 - x - 4$
  - (c)  $x^2 - 5x - 4$
  - (d)  $x^2 - 5x + 6$
  - (e)  $x^2 - x + 6$
  
2. (R4 #84) Expand and simplify  $(2x + 3y)^2$ .
  - (a)  $2x^2 + 3y^2$
  - (b)  $4x^2 + 9y^2$
  - (c)  $4x^2 + 12xy + 9y^2$
  - (d)  $4x^2 + 6xy + 9y^2$
  - (e) None of these
  
3. (R5 122) Factor completely:  $4(x + 5)^3(x - 1)^2 + 2(x + 5)^4(x - 1)$ 
  - (a)  $8(x + 5)^7(x - 1)^3$
  - (b)  $2(x + 5)^3(x - 1)$
  - (c)  $6(x + 5)^3(x - 1)(x + 1)$
  - (d)  $2(x + 5)^3(x - 1)(3x + 7)$
  - (e) None of these
  
4. (R6 10) When  $5x^4 - x^2 + x - 2$  is divided by  $x^2 + 2$  we get
  - (a) quotient:  $5x^2 - 11$ ; remainder:  $x - 24$
  - (b) quotient:  $5x^2 - 11$ ; remainder:  $x + 20$
  - (c) quotient:  $5x^2 + 11$ ; remainder:  $x - 24$
  - (d) quotient:  $5x^2 + 11$ ; remainder:  $x + 20$
  - (e) None of these

5. (R7) Simplify and factor  $\frac{4 + \frac{1}{x^2}}{25 - \frac{1}{x^2}}$ .

(a)  $\frac{4}{25}$

(b)  $\frac{4x^2 + 1}{(x + 5)(x - 5)}$

(c)  $\frac{(2x + 1)(2x - 1)}{(5x + 1)(5x - 1)}$

(d)  $\frac{(x + 2)(x - 2)}{(x + 5)(x - 5)}$

(e)  $\frac{4x^2 + 1}{(5x + 1)(5x - 1)}$

6. (R7 66) After simplifying  $\frac{2}{(x + 2)^2(x - 1)} - \frac{6}{(x + 2)(x - 1)^2}$ , the numerator is

(a)  $-8x - 14$

(b)  $-8x + 10$

(c)  $-4x + 10$

(d)  $-4x - 14$

(e)  $-4x + 14$

7. (R7 72) After simplifying, the numerator of  $\frac{1}{h} \left[ \frac{1}{(x + h)^2} - \frac{1}{x^2} \right]$  is

(a)  $-2x - h$

(b)  $-2x + h$

(c)  $2x - h$

(d)  $2x + h$

(e) None of these

8. (R8) Factor the expression  $x^{1/2}(x^2 + x) + x^{3/2} - 24x^{1/2}$  (where  $x \geq 0$ ).

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

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

(c)  $x^{3/2}(x + 2)(x - 6)$

(d)  $x^{1/2}(x + 6)(x - 4)$

(e)  $(x + 6)(x - 4)$

9. (R8) Multiply and simplify  $(2\sqrt{x} - 3)(2\sqrt{x} + 5)$

(a)  $4x + 4\sqrt{x} - 15$

(b)  $2x + 4\sqrt{x} - 15$

(c)  $4x - 15$

(d)  $4\sqrt{x} - 15$

(e) None of these

10. (R8 Example 7) Simplify  $(x^{2/3}y)(x^{-2}y)^{1/2}$ :

(a)  $x^{8/3}$       (b)  $\frac{y}{x^{2/3}}$       (c)  $\frac{y^{3/2}}{x^{4/3}}$       (d)  $\frac{y^{3/2}}{x^{1/3}}$       (e) None of these

11. (R8 51) After rationalizing the denominator of  $\frac{\sqrt{x+h} - \sqrt{x}}{\sqrt{x+h} + \sqrt{x}}$ , the numerator is

(a)  $2x + h$

(b)  $2x + h - 2\sqrt{x(x+h)}$

(c)  $2x + h + 2\sqrt{x(x+h)}$

(d)  $2x - 2\sqrt{x(x+h)}$

(e) None of these

12. (1.1 49) Solve the equation  $\frac{x}{x-2} + 3 = \frac{2}{x-2}$ .

(a)  $x = 2$

(b)  $x = 1$

(c)  $x = -1$

(d) There is no solution

(e) None of these

13. (1.2) The equation  $1 - \frac{1}{x} - \frac{12}{x^2} = 0$  has
- (a) NO real solutions
  - (b) exactly ONE real solution, which is POSITIVE
  - (c) exactly ONE real solution, which is NEGATIVE
  - (d) exactly TWO real solutions, whose product is  $-12$
  - (e) exactly TWO real solutions, whose product is  $\frac{-1}{12}$
14. (1.2 51) Use the quadratic formula to solve the equation  $\frac{2}{3}x^2 - \frac{5}{3}x + 1 = 0$ . The solutions are
- (a)  $x = -1$  and  $x = -2$
  - (b)  $x = -1$  and  $x = -\frac{3}{2}$
  - (c)  $x = 1$  and  $x = -\frac{3}{2}$
  - (d)  $x = 1$  and  $x = 2$
  - (e) None of these
15. (1.2) Find the value of  $k$  so that  $x^2 - \frac{3}{2}x + k$  is a perfect square.
- (a)  $\frac{3}{4}$
  - (b)  $-\frac{3}{4}$
  - (c)  $\frac{9}{16}$
  - (d)  $-\frac{9}{16}$
  - (e) None of these
16. (1.4 25) Find the real solutions of the equation  $3 + \sqrt{3x + 1} = x$ .
- (a)  $x = 1$
  - (b)  $x = -1$
  - (c)  $x = 1$  and  $x = 8$
  - (d)  $x = -1$  and  $x = 8$
  - (e) None of these