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Final Exam Review - Chapter 7

Section 2 - Factoring by GCF

Factor each polynomial. Check your answer.

1. $8c^2 + 7c$

$c(8c+7)$

2. $3n^3 + 12n^2$

$3n^2(n+4)$

3. $15x^5 - 18x$

$3x(5x^4-6)$

4. $-8s^4 + 20t^3 - 28$

$-4(2s^4-5t^3+7)$

5. $6n^6 + 18n^4 - 24n$

$6n(n^5+3n^3-4)$

6. $-5m^4 - 5m^3 + 5m^2$

$-5m^2(m^2+m-1)$

Factor each expression.

7. $3m(m + 5) + 4(m + 5)$

$(m+5)(3m+4)$

8. $16b(b - 3) + (b - 3)$

$(b-3)(16b+1)$

9. $10d^2 - 6d + (35d - 21)$

$2d(5d-3)+7(5d-3)$

$(5d-3)(2d+7)$

10. $(12n^3 - 15n^2) - 8n + 10)$

$3n^2(4n-5)-2(4n-5)$

$(4n-5)(3n^2-2)$

↓

can not airplane

$b = 0$ dd ?

mult

$(3)(-2) = -6$

$-1, 6$

$1, -6$

$-2, 3$

$2, -3$

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Section 3 - Factoring $x^2 + bx + c$

Factor each trinomial.

1. $x^2 + 9x + 14$ Mult = 14, Add = 9

(x + 7)(x + 2)

2. $x^2 + 7x + 12$ M: 12, A: 7

(x + 4)(x + 3)

3. $x^2 + 9x + 18$ M: 18, A: 9

(x + 3)(x + 6)

4. $x^2 - 12x + 20$ M: 20, A: -12

(x - 10)(x - 2)

5. $x^2 - 11x + 18$ M: 18, A: -11

(x - 9)(x - 2)

6. $x^2 - 12x + 32$ M: 32, A: -12

(x - 8)(x - 4)

7. $x^2 + 2x - 15$ M: -15, A: 2

(x + 5)(x - 3)

8. $x^2 + 5x - 6$ M: -6, A: 5

(x + 6)(x - 1)

9. $x^2 + 5x - 24$ M: -24, A: 5

(x + 8)(x - 3)

10. $x^2 - x - 56$ M: -56, A: -1

(x - 8)(x + 7)

11. $x^2 - 2x - 8$ M: -8, A: -2

(x - 4)(x + 2)

12. $x^2 - x - 20$ M: -20, A: -1

(x - 5)(x + 4)

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Section 4 - Factoring $ax^2 + bx + c$

Factor each trinomial.

1. $2x^2 + 13x + 15$ M: 30 A: 13

$(\frac{2}{2}x + \frac{10}{2})(2x + 3)$

$(x+5)(2x+3)$

2. $3x^2 + 10x + 8$ M: 24 A: 10

$(\frac{3}{3}x + \frac{6}{3})(3x+4)$

$(x+2)(3x+4)$

3. $4x^2 + 24x + 27$ M: 108 A: 24

$(\frac{4}{2}x + \frac{18}{2})(\frac{4}{2}x + \frac{6}{2})$

$(2x+9)(2x+3)$

4. $7x^2 - 59x + 24$ M: 168 A: -59

$(7x-3)(\frac{7}{7}x - \frac{56}{7})$

$(7x-3)(x-8)$

5. $3x^2 - 14x + 15$ M: 45 A: -14

$(\frac{3}{3}x - \frac{9}{3})(3x-5)$

$(x-3)(3x-5)$

6. $8x^2 - 73x + 9$ M: 72 A: -73

$(\frac{8}{8}x - \frac{72}{8})(8x-1)$

$(x-9)(8x-1)$

7. $8x^2 + 29x - 12$ M: -96 A: 29

$(\frac{8}{8}x + \frac{32}{8})(8x-3)$

$(x+4)(8x-3)$

8. $11x^2 + 25x - 24$ M: -264 A: 25

$(\frac{11}{11}x + \frac{33}{11})(11x-8)$

$(x+3)(11x-8)$

9. $9x^2 - 3x - 2$ M: -18 A: -3

$(\frac{9}{3}x - \frac{6}{3})(\frac{9}{3}x + \frac{3}{3})$

$(3x-2)(3x+1)$

10. The area of a rectangle is $20x^2 - 27x - 8$. The length is $4x + 1$. What is the width?

mult. mult.

F L

$(4x+1)(5x - 8)$

F L

$20x^2 - 8$

check: O I

$-32x + 5x = -27x$

$(5x-8)$

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Section 5 - Factoring Special Products

Factor each polynomial.

1. $x^2 + 6x + 9$ M: 9 A: 6

$(x+3)(x+3)$

2. $9x^2 - 12x + 4$ M: 36 A: -12

$(9x-6)(9x-6)$

$(3x-2)(3x-2)$

3. $4x^2 + 20x + 25$ M: 100 A: 20

$(4x+10)(4x+10)$

$(2x+5)(2x+5)$

4. A rectangular fountain in the center of a shopping mall has an area of $(4x^2 + 12x + 9)$ ft^2. The dimensions of the fountain are of the form $cx + d$, where c and d are whole numbers.

a. Factor to find the expressions for the length and width of the fountain. M: 36 A: 12

$4x^2+12x+9$

$\left(\frac{4x}{2} + \frac{6}{2}\right)\left(\frac{4x}{2}+\frac{6}{2}\right) = (2x+3)(2x+3)$ (L, W)

b. Find an expression for the perimeter of the fountain.

$(2x+3) + (2x+3) + (2x+3) + (2x+3) = 8x + 12$

c. Find the perimeter when $x = 2$ ft.

$8(2) + 12 = 16 + 12 = 28$ ft

5. $x^2 - 16$ M: -16 A: 0

$(x+4)(x-4)$

6. $9b^4 - 200$ M: -1800 A: 0

$(3b^2 - 20)$

Can not factor

don't mult = -1800

$\left(\frac{9b^2}{9} - \frac{900}{9}\right)\left(\frac{9b^2}{9} + \frac{900}{9}\right)$

$(b^2 - 100)(b^2 + 100)$

nope!

7. $1 - m^6$ M: 1 A: 0

$(1-m^3)(1+m^3)$

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Section 6 –Factor Using Any Method

Factor each polynomial completely.

1. $6t^2 + 12$

$6(t^2+2)$ M: 2 A: 0 unfactorable

2. $5m^2 + 45m$

$5m(m+9)$

3. $5r^3 - 10r$

$5r(r^2-2)$ M: -2 A: 0 unfactorable

4. $p^2 - 9$

$(p+3)(p-3)$ M: -9 A: 0

5. $x^2 - 25$

$(x+5)(x-5)$

6. $3x^3y + x^2y^2$

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

7. $12n^3 - 48n$

M: -4 A: 0

$12n(n^2-4)$

$12n(n+2)(n-2)$

8. $x^3 - 9x$

M: -9 A: 0

$x(x^2-9)$

$x(x+3)(x-3)$

15. $10w^4 - 160w^2$

M: -16 A: 0

$10w^2(w^2-16)$

$10w^2(w+4)(w-4)$

16. $3c^4 + 24c^3 + 48c^2$

M: 16 A: 8

$3c^2(c^2+8c+16)$

$3c^2(c+4)(c+4)$

17. $3d^2 + 13d + 4$

M: 12 A: 13

$(3d + \frac{12}{3})(3d+1)$

$(d+4)(3d+1)$

18. $6a^3 + 39a^2 + 45a$

M: 30 A: 13

$3a(2a^2+13a+15)$

$3a(\frac{2a}{2} + \frac{10}{2})(2a+3)$

$3a(a+5)(2a+3)$