

UNIT 3 TEST REVIEW

Date _____ Period _____

Factor each.

1) $x^3 - 9x^2 + 20x = 0$

2) $x^3 - 9x = 0$

3) $x^3 + 4x^2 + 2x + 8 = 0$

4) $x^4 - x^3 + 4x^2 - 4x = 0$

Factor each completely.

5) $m^4 + 2m^2 - 3$

6) $6x^4 - 84x^2 + 294$

Factor each.

7) $x^3 + 8 = 0$

8) $x^3 - 125 = 0$

9) $x^3 - 64 = 0$

10) $x^3 + 27 = 0$

11) $x^3 - 27 = 0$

12) $x^3 - 125 = 0$

Factor each completely.

13) $18x^2 + 87x - 126$

14) $36n^3 + 180n^2 + 224n$

Factor each.

15) $x^2 - 25 = 0$

16) $x^3 - 16x = 0$

17) $x^4 + 4x^2 - 32 = 0$

18) $x^4 + 6x^2 - 7 = 0$

State the number of zeros for each function. Next, FACTOR each (write ithe polynomial out in factored form). Finally, state all rational zeros. Students, one factor has been given!!!!

19) $f(x) = 2x^3 - 11x^2 + 19x - 10; x - 2$

20) $f(x) = 15x^3 - 26x^2 + 13x - 2; 3x - 1$

State the number of zeros/roots.

21) $f(x) = 5x^5 + 28x^3 - 12x$

22) $f(x) = 3x^5 - 15x^4 - 23x^3 + 115x^2 + 14x - 70$

Find all roots. BASIC FACTORING!

23) $x^3 + x^2 - 2x = 0$

24) $x^3 - 25x = 0$

25) $x^3 - 9x = 0$

Find all zeros. QUADRATIC FORMULA

26) $f(x) = x^3 - 3x^2 - 6x$

27) $f(x) = 3x^3 - x^2 - 5x$

28) $f(x) = x^3 + 11x^2 + 6x$

Find all zeros. Hint: 4 terms - GROUPING!!

29) $f(x) = 3x^3 - 2x^2 + 6x - 4$

30) $f(x) = 3x^3 + 5x^2 - 12x - 20$

Find all zeros. Hint: 4 Terms- GROUPING!! Look closely before you start factoring! What do you notice?

31) $f(x) = 5x^4 + 4x^3 - 15x^2 - 12x$

32) $f(x) = 3x^5 + 12x^4 - 2x^3 - 8x^2$

Find all zeros. Hint: What pattern do you see? Hopfully perfect cubes!!:)

33) $f(x) = x^3 + 8$

34) $f(x) = 8x^3 + 125$

State the possible rational zeros for each function. Then find all zeros. Hint: Any method of factoring and/or solving may exist in this section. You must decide.

35) $f(x) = x^3 - 5x^2 - 3x + 15$

36) $f(x) = x^3 - 2x^2 - 3x + 6$

Factor each completely.

37) $m^2 - 7mn - 18n^2$

38) $x^2 - 8xy - 20y^2$

UNIT 3 TEST REVIEW

Date _____ Period _____

Factor each.

1) $x^3 - 9x^2 + 20x = 0$ $x(x-4)(x-5) = 0$

2) $x^3 - 9x = 0$ $x(x-3)(x+3) = 0$

3) $x^3 + 4x^2 + 2x + 8 = 0$ $(x+4)(x^2+2) = 0$

4) $x^4 - x^3 + 4x^2 - 4x = 0$ $x(x-1)(x^2+4) = 0$

Factor each completely.

5) $m^4 + 2m^2 - 3$ $(m-1)(m+1)(m^2+3)$

6) $6x^4 - 84x^2 + 294$ $6(x^2-7)^2$

Factor each.

7) $x^3 + 8 = 0$ $(x+2)(x^2-2x+4) = 0$

8) $x^3 - 125 = 0$ $(x-5)(x^2+5x+25) = 0$

9) $x^3 - 64 = 0$ $(x-4)(x^2+4x+16) = 0$

10) $x^3 + 27 = 0$ $(x+3)(x^2-3x+9) = 0$

11) $x^3 - 27 = 0$ $(x-3)(x^2+3x+9) = 0$

12) $x^3 - 125 = 0$ $(x-5)(x^2+5x+25) = 0$

Factor each completely.

13) $18x^2 + 87x - 126$ $3(x+6)(6x-7)$

14) $36n^3 + 180n^2 + 224n$ $4n(3n+8)(3n+7)$

Factor each.

15) $x^2 - 25 = 0$ $(x-5)(x+5) = 0$

16) $x^3 - 16x = 0$ $x(x-4)(x+4) = 0$

17) $x^4 + 4x^2 - 32 = 0$ $(x^2+8)(x-2)(x+2) = 0$

18) $x^4 + 6x^2 - 7 = 0$ $(x^2+7)(x-1)(x+1) = 0$

State the number of zeros for each function. Next, FACTOR each (write it the polynomial out in factored form). Finally, state all rational zeros. Students, one factor has been given!!!!

19) $f(x) = 2x^3 - 11x^2 + 19x - 10$; $x - 2$ # of complex zeros: 3

Factors to: $f(x) = (2x-5)(x-1)(x-2)$

20) $f(x) = 15x^3 - 26x^2 + 13x - 2; 3x - 1$ # of complex zeros: 3
 Factors to: $f(x) = (5x - 2)(x - 1)(3x - 1)$

State the number of zeros/roots.

21) $f(x) = 5x^5 + 28x^3 - 12x$ # of complex zeros: 5
 Rational zeros: $\left\{\frac{2}{5}, 1, \frac{1}{3}\right\}$

Possible # of imaginary zeros: 4, 2, or 0

22) $f(x) = 3x^5 - 15x^4 - 23x^3 + 115x^2 + 14x - 70$ # of complex zeros: 5
 Possible # of imaginary zeros: 4, 2, or 0

Find all roots. BASIC FACTORING!

23) $x^3 + x^2 - 2x = 0$ $\{0, 1, -2\}$

24) $x^3 - 25x = 0$ $\{0, 5, -5\}$

25) $x^3 - 9x = 0$ $\{0, 3, -3\}$

Find all zeros. QUADRATIC FORMULA

26) $f(x) = x^3 - 3x^2 - 6x$ $\left\{0, \frac{3 + \sqrt{33}}{2}, \frac{3 - \sqrt{33}}{2}\right\}$

27) $f(x) = 3x^3 - x^2 - 5x$ $\left\{0, \frac{1 + \sqrt{61}}{2}, \frac{1 - \sqrt{61}}{2}\right\}$

28) $f(x) = x^3 + 11x^2 + 6x$ $\left\{0, \frac{-11 + \sqrt{97}}{2}, \frac{-11 - \sqrt{97}}{2}\right\}$

Find all zeros. Hint: 4 terms - GROUPING!!

29) $f(x) = 3x^3 - 2x^2 + 6x - 4$ $\left\{\frac{2}{3}, i\sqrt{2}, -i\sqrt{2}\right\}$

30) $f(x) = 3x^3 + 5x^2 - 12x - 20$ $\left\{-\frac{5}{3}, 2, -2\right\}$

Find all zeros. Hint: 4 Terms- GROUPING!! Look closely before you start factoring! What do you notice?

31) $f(x) = 5x^4 + 4x^3 - 15x^2 - 12x$ $\left\{0, -\frac{4}{5}, \sqrt{3}, -\sqrt{3}\right\}$

32) $f(x) = 3x^5 + 12x^4 - 2x^3 - 8x^2$ $\left\{0 \text{ mult. } 2, -4, \frac{\sqrt{6}}{3}, -\frac{\sqrt{6}}{3}\right\}$

Find all zeros. Hint: What pattern do you see? Hopfully perfect cubes!:(

33) $f(x) = x^3 + 8$ $\{-2, 1 + i\sqrt{3}, 1 - i\sqrt{3}\}$

34) $f(x) = 8x^3 + 125$ $\left\{-\frac{5}{2}, \frac{5 + 5i\sqrt{3}}{4}, \frac{5 - 5i\sqrt{3}}{4}\right\}$

State the possible rational zeros for each function. Then find all zeros. Hint: Any method of factoring and/or solving may exist in this section. You must decide.

35) $f(x) = x^3 - 5x^2 - 3x + 15$ Possible rational zeros: $\pm 1, \pm 3, \pm 5, \pm 15$

36) $f(x) = x^3 - 2x^2 - 3x + 6$ Zeros: $\{5, \sqrt{3}, -\sqrt{3}\}$
 Possible rational zeros: $\pm 1, \pm 2, \pm 3, \pm 6$

Zeros: $\{2, \sqrt{3}, -\sqrt{3}\}$

Factor each completely.

37) $m^2 - 7mn - 18n^2$ $(m + 2n)(m - 9n)$

38) $x^2 - 8xy - 20y^2$ $(x + 2y)(x - 10y)$