Final Exam Review

Factor each completely.

1) $27m^3 + 125n^3$

Divide.

2) $(m^3 - 12m^2 + 41m - 22) \div (m - 6)$

Factor each. One root has been given.

3) $x^4 + 8x^3 + 26x^2 + 48x + 45 = 0;\ -1 + 2i$

Describe the end behavior of each function.

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

Find all zeros.

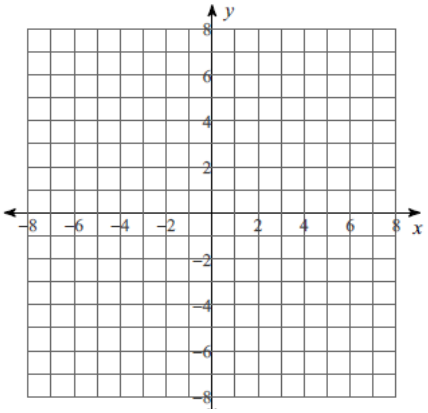
5) $f(x) = 3x^3 + 5x^2 + x - 1$

6) $f(x) = x^3 + x^2 - 4x - 24$

7) $f(x) = 5x^4 - 7x^2 + 2$

Sketch the graph of each function.

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



State the excluded values for each.

9) $\dfrac{7a^2 + 20a - 3}{5a^2 + 19a + 12}$

Simplify each expression.

10) $\dfrac{3r^2 + 18r - 81}{2r^2 + 15r - 27}$

11) $\dfrac{4b}{b+5} + \dfrac{5}{b+1}$

12) $\dfrac{5}{x-3} - \dfrac{6x}{2x+5}$

13) $\dfrac{14a^2 - 63a + 49}{7 - 2a} \div \dfrac{7a - 7}{a + 7}$

Solve each equation. Remember to check for extraneous solutions.

14) $\dfrac{3}{5n} + 1 = \dfrac{1}{5n}$

Identify the hole if it exist.

15) $f(x)=\dfrac{x^2-4x}{-4x^2+20x-16}$

Find the slant asymptote.

16) $f(x)=\dfrac{x-1}{2x^2-6x}$

Identify the x-intercepts of each.

17) $f(x)=\dfrac{x^3+5x^2+4x}{-4x^2+36}$

Identify the y-intercept.

18) $f(x)=\dfrac{x+2}{-2x^2+18}$

Identify the vertical asymptotes and horizontal asymptote

19) $f(x)=\dfrac{x-2}{-4x+16}$

Identify the domain and range

20) $y=\dfrac{4}{5}\sqrt{-2x+4}+2$

Solve each equation. Remember to check for extraneous solutions.

21) $-4+\sqrt{6x+15}=x$

Identify the transformation.

22) $y=-4\sqrt[3]{3x+6}+3$

Simplify.

23) $-7\sqrt[4]{162h^7j^5k^5}$

Condense each expression to a single logarithm.

24) $\log_2 x+\log_2 y-\log_2 w-3\log_2 z$

Solve the equation.

25) $\log_3(x+2)-\log_3 x=5$

Find the inverse of each function.

26) $y=\left(\dfrac{e^x+3}{2}\right)^{\frac{1}{5}}$

27) $y=\log_6(2x+8)$

Solve each equation.

28) $64^{2b}\cdot 16^{-3b}=\left(\dfrac{1}{4}\right)^{-3b+3}$

29) $7^{x+2}-3=59$

Find each product.

30) $(6-8m)^4$

Sketch the graph of each function and determine the interval over which it is increasing or decreasing.

31) $y=5\cdot\left(\dfrac{1}{2}\right)^{x-1}-1$

32) $y=4\cdot 2^{x-1}-2$

33) $y=-2\left|-2x+1\right|-4$