PreCalculus Trimester B Name Key Hr____

Final Review Part 1

Determine whether the following are polynomial functions and if they are, state the degree.

1. $14x^2 + 2x^{1/3} - 5$ no, because of 1/3 exponent.

2. $(x-3)^2(x+7)$ yes, degree 3.

Find all the real zeros and state their multiplicities.

3. $2(x-7)^4(x+3)^2$

7 mult. 4, -3 mult. 2

4. $x^2 + 5x - 50$

$(x+10)(x-5)$

-10 mult 1, 5 mult. 1

Find a polynomial of minimum degree that has the given zeros.

5. 3, 7, -2 $(x-3)(x-7)(x+2)$

6. -5 (multiplicity 2), 4 (multiplicity 3)

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

For the following polynomial (a) list each real zero and its multiplicity (b) determine whether the graph touches or crosses at each x-intercept (c) find the y-intercept (d) sketch the graph.

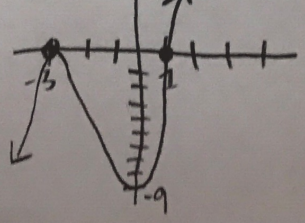
7. $f(x) = (x-1)(x+3)^2$

c) $f(0) = (0-1)(0+3)^2 = (-1)(9) = -9$

a) 1 mult 1
-3 mult. 2

b) crosses at 1 (since mult. is odd)
touches at -3 (since mult is even)

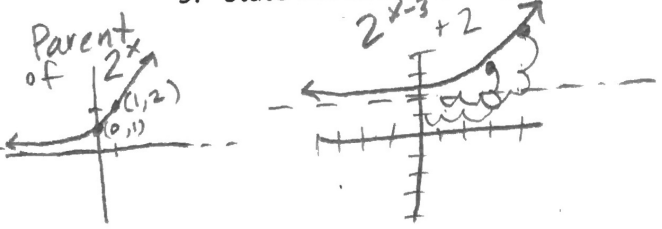
d) degree is 3 & function is positive so left falls, right rises.



8. Evaluate $30e^{t(3.2)}$ when t = 15.

$30e^{(15)(3.2)} = 2.105 \times 10^{22}$

9. State the domain, range and horizontal asymptote of: $f(x) = 2^{x-3} + 2$ right 3 up 2



domain: $(-\infty, \infty)$
range: $(2, \infty)$
h.a.: $y = 2$

10. $1550 dollars is invested in an account that pays 7% interest compounded continuously.

What will the balance in the account be after 12 years? $(A = Pe^{rt})$

$A = ?$ $r = 0.07$
$P = 1550$ $t = 12$

$A = 1550e^{(.07)(12)}$ $3590.37

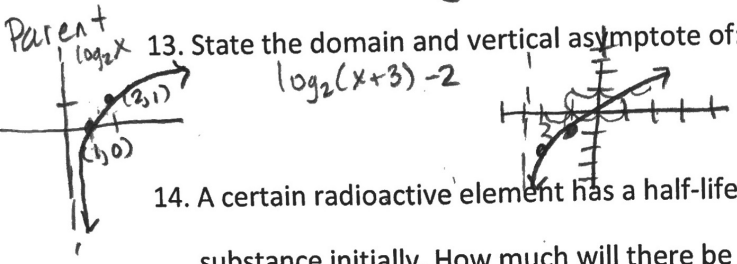
11. Write in exponential form: $log_2 16 = 4$

$2^4 = 16$

12. Write in logarithmic form: $4^3 = 64$

$\log_4 64 = 3$

13. State the domain and vertical asymptote of: $f(x) = log_2(x + 3) - 2$. left 3 down 2



domain: $(-3, \infty)$
v.a.: $x = -3$

14. A certain radioactive element has a half-life of 840 years. There are 20 pounds of this substance initially. How much will there be after 1700 years? $(y = a(b)^{t/p})$

$a = 20$ pounds
$b = 1/2$
$p = 840$ yrs
$t = 1700$ yrs
$y = ?$

$y = 20\left(\frac{1}{2}\right)^{1700/840} = 4.9$ pounds

15. The number of bacteria in a culture doubles every 4 hours. There are 90 bacteria initially.

How long until there will be 459 bacteria?

$459 = 90(2)^{t/4}$

$t = 4\left(\frac{\log 5.1}{\log 2}\right) = 9.4$ hours

$b = 2$
$p = 4$ hrs
$a = 90$
$t = ?$
$y = 459$

$\frac{459}{90} = \frac{90(2)^{t/4}}{90}$

$5.1 = 2^{t/4}$

$\log_2 5.1 = t/4$

$t = 4 \log_2 5.1 =$