MAT 151 Phoenix College Practice Key T2

Please show all work and steps in pencil

1. Sketch the graph of the quadratic function given by $y = f(x) = -(x+1)^2 + 2$. Identify the vertex and x and y intercepts

I am sorry but I could not make the graph print
It opens down and the vertex is at (-1, 2)
You can view this on you graphing calculator

x-intercepts (-2.4 , 0) & (.4 , 0) from the calculator

y-intercept (0 , 1) or crosses the y axis at positive one

Vertex (- 1 2)

2. Describe the left and right hand behavior of the graph $y = f(x) = 12x^3 - 5x^2 - 49x + 15$

left behavior - down towards negative infinity, falls to left

right behavior - up towards positive infinity, rises to right

3. Simplify $\dfrac{x^4 + 4x^3 - 19x^2 - 106x - 120}{x^2 - 3x - 10}$

see example #3 on page3 128 as a guide
your answer should appear as
$x^2 + 7x + 12$

4. List all the possible rational zeros of
$y = f(x) = 2x^3 + 3x^2 - 8x + 3$

1, -1, 3, -3, $\frac{1}{2}, -\frac{1}{2}, \frac{3}{2}, -\frac{3}{2}$

Perform the indicated operation and write the result in standard form $(a + bi)$

5. $(10 - 2i) - (3 + 7i)$

$(10 - 2i) - 1(3 + 7i)$ put - 1 in front of (3+7i)
$10 - 2i - 3 - 7i$ use the distributive prop
$10 - 3 - 2i - 7i$ put like terms together
$7 - 9i$ combine like terms

6. $(5 + \sqrt{-12})(3 - \sqrt{-12})$

$(5+\sqrt{12}\ i)(3-\sqrt{12}\,i)$

$15-2\sqrt{12}\,i-\sqrt{144}\,i^2$ take i outside sq root

$15-2\sqrt{4}\sqrt{3}\,i-12(-1)$ multiply by FOIL

$15-2(2)\sqrt{3}\,i+12$ remember $i^2=-1$

$27-2\sqrt{12}\,i$ multiple - 12 * - 1 = 12

combine like terms

7. $(4+3i)(2-5i)$

$8-14i-15i^2$ multiply by FOIL

$8-14i-15(-1)$ remember $i^2=-1$

$8-14i+15$ multiple - 15 * - 1 = 15

$23-14i$ combine like terms

8. $\frac{(1+i)}{(1-i)}*\frac{(1+i)}{(1+i)}$ multiply by conjugate

$\frac{1+2i+i^2}{1-i^2}$ multiply by FOIL

$\frac{1+2i+(-1)}{1-(-1)}$ remember $i^2=-1$

$\frac{2i}{2}=i$ simplify like terms

9. Find a polynomial with zeros of $2, 3i$ and $-3i$

$x=2 \quad x=3i \quad x=-3i$

$x-2=0 \quad x-3i=0 \quad x+3i=0$

$(x-2)(x-3i)(x+3i)=0$

$(x-2)(x^2-9i^2)=0$

$(x-2)(x^2-9(-1))=0$

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

$x^3-2x^2+9x-18=0$

10. Find a polynomial with zeros of $1,\ 2,$ and -3

$(x-1)=0 \quad (x-2)=0 \quad (x+3)=0$

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

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

$x^3+x^2-6x-x^2-x+6=0$

$x^3-7x+6=0$

*the test will probably have a quadratic formula problem
most of the problems came off the chap. test page 128
you can double check the answers in case if goofed up
many similar practice review problems can be found on
pages183-184-185 and odd answers are in back of book