Math 203 Test No. 3 Name_____

Problems are worth 6 points each (+4 free = 100).
Circle the correct answer.

1. Find the real solutions of $2x^2 - 15x + 7 = 0$

A) $x = \frac{1}{2}, 7$ B) $x = 1, -7$

C) $x = 0, 7$ D) $x = \frac{2}{7}, 15$

2. Find the complex solutions of $x^2 - 4x + 13 = 0$

A) $4 \pm 6i$ B) $6 \pm 4i$ C) $3 \pm 2i$ D) $2 \pm 3i$

3. Find the vertex of $f(x) = 3x^2 - 12x + 2$

A) (2, -10) B) (-2, 30) C) (0, 2) D) (3, -2)

4. Find the range of the parabola $f(x) = 3x^2 - 2x - 7$

A) $[-\frac{22}{3}, \infty) = [-7.333, \infty)$

B) $[\frac{1}{3}, \infty) = [0.333, \infty)$

C) $[-\frac{20}{3}, \infty) = [-6.667, \infty)$

D) $(-\infty, \frac{1}{3}] = (-\infty, 0.333]$

Solve the following:

5. $\frac{4}{x+2} - \frac{1}{x-1} = \frac{5}{x+2}$

(a) $\frac{1}{2}$ (b) $-\frac{1}{2}$

(c) -2 (d) $\emptyset$

6. $|3m - 4| = 11.$

(a) 5 (b) $-5, \frac{7}{3}$

(c) $5, -\frac{7}{3}$ (d) $-\frac{7}{3}$

7. $|4x - 7| < 11$

(a) $\left(-1, \frac{9}{2}\right)$ (b) $(-\infty, -1) \cup \left(\frac{9}{2}, \infty\right)$

(c) $(-\infty, -1)$ (d) $\left(\frac{9}{2}, \infty\right)$

Simplify the following:

8. $(4 - 2i)(3 - 4i)$

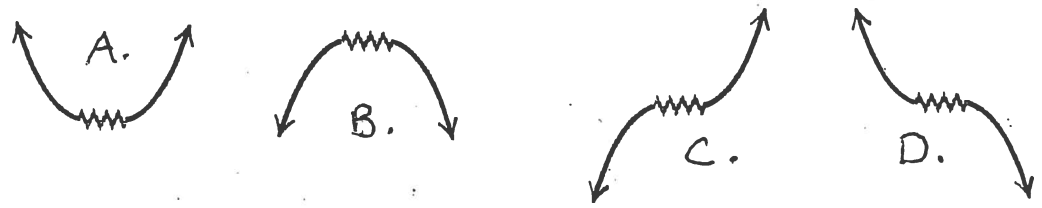
(a) $20 - 22i$ (b) $4 - 22i$

(c) $20 - 10i$ (d) $4 - 10i$

9. $\frac{10i}{1 + 3i}$

(a) $3 + i$ (b) $3 - i$

(c) $-3 + i$ (d) $-3 - i$



10. Which of the end behaviors illustrated above match the function $f(x) = 3x^8 - 4x^3 - 5x^2 + 2$

A) example A B) example B C) example C D) example D

11. Find the zeros of $f(x) = (x - 7)(x + 3)(2x - 1)$

A) $(7, 0)$ $(-3, 0)$ $(\frac{1}{2}, 0)$ C) $(0, 7)$ $(0, -3)$ $(0, \frac{1}{2})$

B) $(-7, 0)$ $(3, 0)$ $(-\frac{1}{2}, 0)$ D) $(0, -7)$ $(0, 3)$ $(0, -\frac{1}{2})$

For problem 12 $f(x) = (x + 3)^4 (x - 2)^3 (x + 7)^2 (x - 1)$

12. At what points does f(x) touch but <u>not</u> cross the x axis?

A) (1, 0) (2, 0)

B) (-1, 0) (-2, 0)

C) (-3, 0) (-7, 0)

D) (3, 0) (7, 0)

13. Solve the inequality $2x^2 + 7x - 15 > 0$

A) $(-5, \frac{3}{2})$

B) $(-\frac{3}{2}, 5)$

C) $(-\infty, -5) \cup (\frac{3}{2}, \infty)$

D) $(-\infty, -\frac{3}{2}) \cup (5, \infty)$

14. Find the range of $f(x) = -2x^4 + 5x - 1$

A) $(0.855, \infty)$

B) $(-\infty, 0.855)$

C) $(2.206, \infty)$

D) $(-\infty, 2.206)$

15. Which of the following is a factor of
$P(x) = -9x^3 + 2x^2 + x - 10$?

(a) $x + 10$

(b) $x - 10$

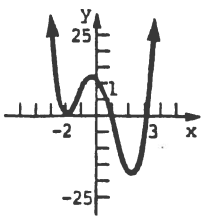
(c) $x + 1$

(d) $x - 1$

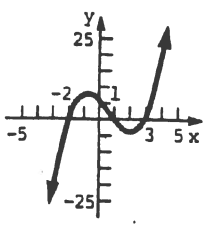
Identify the graph of the given function

16. $P(x) = (x - 1)(x - 3)(x + 2)^2$

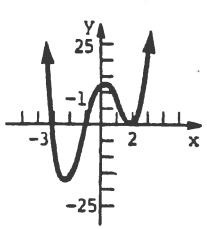
(a)



(b)



(c)



(d)