Final Exam Fall Practice Test

Date_____ Period____

Name each polynomial by degree and number of terms.

1) $6x$

A) fifth degree trinomial
B) linear monomial
C) constant monomial
D) linear binomial

2) $6 - 9n^2$

A) quadratic trinomial
B) linear binomial
C) cubic binomial
D) quadratic binomial

Simplify each expression.

3) $\left(7x^2 + 3x^4 - 6\right) + \left(7x^2 + 4 + 4x^4\right)$

A) $20x^4 + 14x^2 - 2$
B) $13x^4 + 14x^2 - 2$
C) $20x^4 + 12x^2 - 2$
D) $7x^4 + 14x^2 - 2$

4) $\left(6x^2 + x + 4x^3\right) - \left(3x - 8x^2 - x^3\right)$

A) $5x^3 + 14x^2 - 2x$
B) $5x^3 + 22x^2 + 5x$
C) $5x^3 + 14x^2 + 5x$
D) $5x^3 + 30x^2 + 5x$

Find each product.

5) $(3n - 7)(7n - 5)$

A) $21n^2 - 64n + 35$
B) $21n^2 - 34n - 35$
C) $12n^2 + 8n - 20$
D) $5n^2 + 3n - 2$

6) $(4b + 4)\left(b^2 + 4b - 2\right)$

A) $36b^3 - 12b^2 - 24$
B) $30b^3 - 13b^2 + 3b + 1$
C) $4b^3 + 20b^2 + 8b - 8$
D) $5b^3 + 27b^2 - 54b + 14$

Simplify.

7) $(-5 - 4i) - (7 + i)$

A) $-12 - 5i$　　　B) $-13 - 4i$
C) $-17 - 6i$　　　D) $2 - 3i$

8) $(1 + 4i) + (2 - 5i)$

A) $-3 - i$　　　B) $1 + i$
C) $3 - i$　　　D) $-1 - 9i$

9) $(7 - 2i)(5 + 4i)$

A) $27 - 38i$ B) $43 + 18i$

C) $71 + 22i$ D) $23 + 14i$

10) $(4 - 8i)^2$

A) 25 B) $-48 - 64i$

C) 36 D) $-48 + 64i$

Perform the indicated operation.

11) $g(n) = n + 3$
    $h(n) = -2n + 1$
    Find $g(h(n))$

A) $9n^2 - 6n - 3$ B) $-2n + 4$

C) $-2n - 5$ D) $2n - 5$

12) $g(x) = 2x + 4$
    $h(x) = x^3 + 2$
    Find $g(x) - 3h(x)$

A) $-x^3 + 6x - 10$

B) $x^2 + 14x + 6$

C) $-3x^3 + 2x - 2$

D) $x^3 - 6x - 10$

Factor each completely.

13) $125a^3 + 27$

A) $(5a + 3)^3$

B) $(5a + 3)(5a - 3)^2$

C) $(5a + 3)(25a^2 - 15a + 9)$

D) $(5a - 3)(25a^2 + 15a + 9)$

14) $15k^3 + 40k^2 + 6k + 16$

A) $(5k^2 - 2)(5k^2 + 8)$

B) $(5k^2 + 2)(5k^2 - 8)$

C) $(5k^2 - 2)(3k - 2)$

D) $(5k^2 + 2)(3k + 8)$

Solve each equation by factoring.

15) $n^2 - 13n = -42$

A) $\{-8\}$ B) $\{7, 6\}$

C) $\{4, -7\}$ D) $\{-1, 0\}$

16) $2x^2 = 15x - 28$

A) $\left\{\dfrac{7}{2}, 4\right\}$ B) $\left\{\dfrac{7}{2}, 2\right\}$

C) $\left\{\dfrac{8}{5}, \dfrac{5}{7}\right\}$ D) $\left\{\dfrac{1}{5}, \dfrac{3}{2}\right\}$

Solve each equation by taking square roots.

17) $4n^2 - 4 = -32$

   A) $\{3i, -3i\}$ B) $\{3i\}$

   C) $\{2, -2\}$ D) $\{i\sqrt{7}, -i\sqrt{7}\}$

Solve each equation with the quadratic formula.

18) $v^2 + 4v + 5 = 0$

   A) $\{2\sqrt{6}, -2\sqrt{6}\}$

   B) $\{2\sqrt{2}, -2\sqrt{2}\}$

   C) $\{-2 + i, -2 - i\}$

   D) $\{\sqrt{2}, -\sqrt{2}\}$

Find all rational zeros. One zero has been given.

19) $f(x) = x^3 - 6x^2 + 3x + 10;\ \ 2$

   A) $\{-7, -1, 2\}$ B) $\{5, -1, -3\}$

   C) $\{5, -1, 2\}$ D) $\{5, -3, 2\}$

Find all zeros.

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

   A) $\left\{-\dfrac{1}{3}, \dfrac{\sqrt{10}}{5}, -\dfrac{\sqrt{10}}{5}\right\}$

   B) $\{0\ \text{mult. } 3\}$

   C) $\left\{-1, \dfrac{\sqrt{10}}{5}, -\dfrac{\sqrt{10}}{5}\right\}$

   D) $\left\{-\dfrac{1}{2}, \dfrac{\sqrt{10}}{5}, -\dfrac{\sqrt{10}}{5}\right\}$

21) $f(x) = 4x^3 + 20x^2 + 5x + 25$

   A) $\left\{-5, \dfrac{i\sqrt{30}}{5}, -\dfrac{i\sqrt{30}}{5}\right\}$

   B) $\left\{-7, \dfrac{i\sqrt{5}}{2}, -\dfrac{i\sqrt{5}}{2}\right\}$

   C) $\left\{-4, \dfrac{i\sqrt{5}}{2}, -\dfrac{i\sqrt{5}}{2}\right\}$

   D) $\left\{-5, \dfrac{i\sqrt{5}}{2}, -\dfrac{i\sqrt{5}}{2}\right\}$

Write a polynomial function of least degree with integral coefficients that has the given zeros.

22) -5, -2, 5

   A) $f(x) = x^3 + x^2 - 25x - 50$
   B) $f(x) = x^3 + 2x^2 - 25x - 50$
   C) $f(x) = x^3 + 2x^2 - 29x - 50$
   D) $f(x) = x^3 - 25x - 50$

23) 5, $-2i$, $2i$

   A) $f(x) = x^3 - 5x^2 + 3x - 20$
   B) $f(x) = x^3 - 5x^2 + 4x - 19$
   C) $f(x) = x^3 - 5x^2 + 4x - 20$
   D) $f(x) = x^3 - 5x^2 + 4x - 25$

Divide.

24) $(b^3 - 5b^2 - 2b + 29) \div (b - 3)$

   A) $b^2 - 2b - 9 + \dfrac{7}{b-3}$

   B) $b^2 - 4b - 8 + \dfrac{6}{b-3}$

   C) $b^2 - 2b - 8 + \dfrac{7}{b-3}$

   D) $b^2 - 2b - 8 + \dfrac{5}{b-3}$

25) $(n^4 + 9n^3 - 5n - 50) \div (n + 9)$

   A) $n^3 - 2$

   B) $n^3 - 7 - \dfrac{10}{n+9}$

   C) $n^3 - 2 - \dfrac{6}{n+9}$

   D) $n^3 - 5 - \dfrac{5}{n+9}$

Simplify each expression.

26) $\dfrac{p^2 + 10p + 21}{p^2 + 17p + 70}$

   A) $\dfrac{p-8}{p+8}$ B) $\dfrac{p+10}{p+3}$

   C) $\dfrac{p+3}{p+10}$ D) $\dfrac{p-10}{2}$

27) $\dfrac{1}{x+9} \cdot \dfrac{x^2 + 11x + 10}{x+10}$

   A) $\dfrac{x+1}{x+9}$ B) $\dfrac{x+9}{6x^2}$

   C) $\dfrac{3x^2}{x+7}$ D) $6(x+3)$

28) $\dfrac{12x^3 + 18x^2}{x + 4} \div \dfrac{12x^3 + 18x^2}{x + 2}$

   A) $\dfrac{6}{x + 1}$ B) $\dfrac{x + 2}{x + 4}$

   C) $\dfrac{6}{x - 7}$ D) $8x$

29) $\dfrac{5x - 3}{4x - 4} - \dfrac{x - 5}{4x - 4}$

   A) $\dfrac{2x + 1}{2x - 2}$ B) $\dfrac{7x + 3}{4x - 4}$

   C) $\dfrac{2x + 3}{5x + 1}$ D) $\dfrac{-30x + 15}{16x^2 - 32x + 16}$

30) $\dfrac{4}{3m + 3} + \dfrac{2}{m - 2}$

   A) $\dfrac{-4 - m}{3(m + 1)}$

   B) $-\dfrac{4}{3(m + 1)}$

   C) $\dfrac{-3m + 1}{3(m + 1)}$

   D) $\dfrac{10m - 2}{3(m - 2)(m + 1)}$

Solve each equation. Remember to check for extraneous solutions.

31) $\dfrac{2a - 6}{3a^2} = \dfrac{1}{a} + \dfrac{1}{3a}$

   A) $\{-3, 0\}$ B) $\{-3\}$
   C) $\{-4\}$ D) $\{6\}$

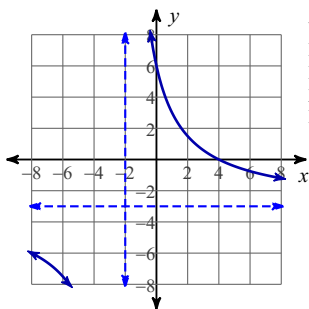32) $\dfrac{1}{a^2 - 6a} = \dfrac{2}{a^2 - 6a} - \dfrac{1}{a}$

   A) $\left\{\dfrac{4}{3}\right\}$ B) $\{-7\}$

   C) $\{5\}$ D) $\{7\}$

Identify the holes, vertical asymptotes, x and y-intercepts, horizontal asymptote, and domain of each. Then sketch the graph.
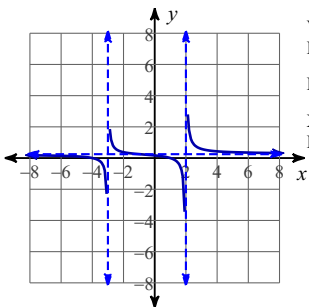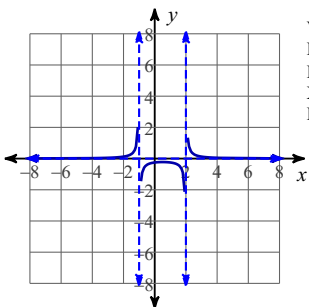
33) $f(x) = \dfrac{x+2}{-3x+12}$

A)

Vertical Asym.: $x = -2$
Holes: None
Horz. Asym.: $y = -3$
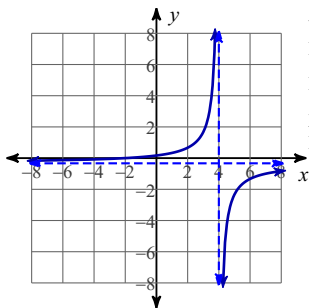X-intercepts: 4
Domain:
 All reals except -2

B)

Vertical Asym.: $x = 2$, $x = -3$
Holes: None
Horz. Asym.: $y = \dfrac{1}{4}$
X-intercepts: 1, -4
Domain:
 All reals except 2, -3

C)

Vertical Asym.: $x = 2$, $x = -1$
Holes: None
Horz. Asym.: $y = 0$
X-intercepts: None
Domain:
 All reals except 2, -1

D)

Vertical Asym.: $x = 4$
Holes: None
Horz. Asym.: $y = -\dfrac{1}{3}$
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Algebra 2 w/Support
Name_____ ID: 4

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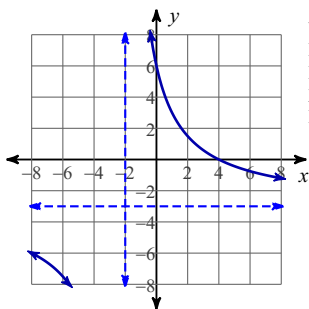
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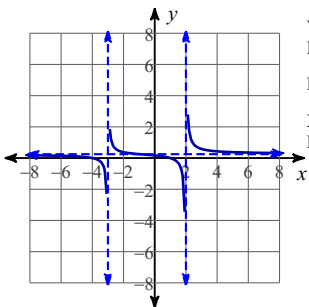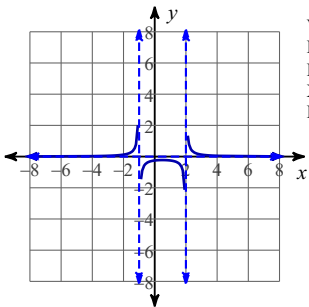
33) $f(x) = \dfrac{x + 2}{-3x + 12}$

A)

Vertical Asym.: $x = -2$
Holes: None
Horz. Asym.: $y = -3$
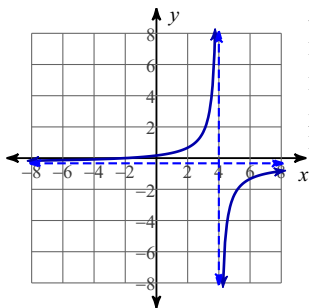X-intercepts: 4
Domain:
  All reals except -2

B)

Vertical Asym.: $x = 2$, $x = -3$
Holes: None
Horz. Asym.: $y = \dfrac{1}{4}$
X-intercepts: 1, -4
Domain:
  All reals except 2, -3

C)

Vertical Asym.: $x = 2$, $x = -1$
Holes: None
Horz. Asym.: $y = 0$
X-intercepts: None
Domain:
  All reals except 2, -1

*D)

Vertical Asym.: $x = 4$
Holes: None
Horz. Asym.: $y = -\dfrac{1}{3}$
X-intercepts: -2
Domain:
  All reals except 4