Sample Test 3

Name_____

In the real test you will have 10 questions and the following rules:

You have 75 minutes to complete the test below. The usage of books or notes, or communication with other students is not allowed. Ask me if you have questions.

This is a multiple choice test.You do not have to justify your answer. If , however, you are not sure that your selection is correct, put a star (*) in front of the question number, and include your calculations on an attached sheet. **I will look at an attached calculation only if I see a star in front of the question number.**
–If you mark an incorrect answer but your calculations contain only minor mistakes, you will get up to 75% credit for the problem.
–Beware: if you instruct me to look at a severely incorrect calculation, you will lose at least 50% of the credit, **even if by chance you mark the correct answer**. *(No credit is given for an incorrect answer and totally incorrect calculations.)*
You get full credit if you mark the correct answer, and mark no star, or if you mark the correct answer, express doubt by marking a star, but I find your calculations perfectly correct.

If the following defines a one–to–one function, find the inverse.

1) $2x - y = 4$

A) $f(x) = \frac{x + 2}{2}$ B) $f^{-1}(x) = \frac{x - 4}{2}$ C) $f^{-1}(x) = \frac{x + 4}{2}$ D) $f^{-1}(x) = \frac{x - 2}{2}$

Find the coordinates of the vertex of the parabola.

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

A) (–5, 4) B) (–4, 5) C) (4, –5) D) (4, –25)

Find the equation of the axis of symmetry of the parabola.

3) $f(x) = (x + 2)^2 + 7$

A) $x = 0$ B) $x = -2$ C) $x = 2$ D) $y = -2$

Solve the problem.

4) A farmer has 1000 yards of fencing to enclose a rectangular garden. Express the area A of the rectangle as a function of the width x of the rectangle. What is the domain of A?

A) $A(x) = x^2 + 500x, 0 < x < 500$ B) $A(x) = -x^2 + 1000x, 0 < x < 1000$
C) $A(x) = -x^2 + 500x, 0 < x < 1000$ D) $A(x) = -x^2 + 500x, 0 < x < 500$

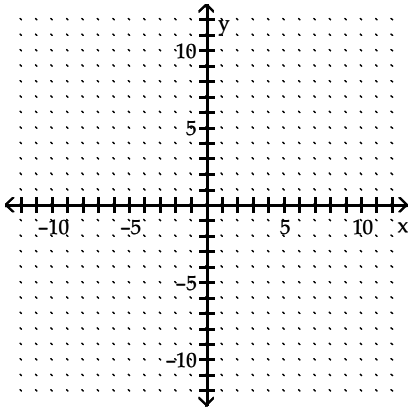
For the polynomial, list each real zero and its multiplicity. Determine whether the graph crosses or touches the x–axis at each x –intercept.

5) $f(x) = 2(x - 6)(x + 6)^2$

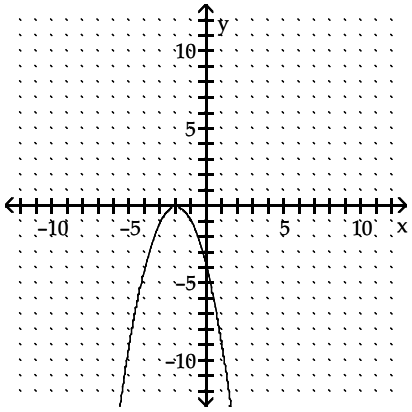
A) –6, multiplicity 1, touches x–axis; 6, multiplicity 2, crosses x–axis
B) –6, multiplicity 1, crosses x–axis; 6, multiplicity 2, touches x–axis
C) 6, multiplicity 1, touches x–axis; –6, multiplicity 2, crosses x–axis
D) 6, multiplicity 1, crosses x–axis; –6, multiplicity 2, touches x–axis

Graph the function.

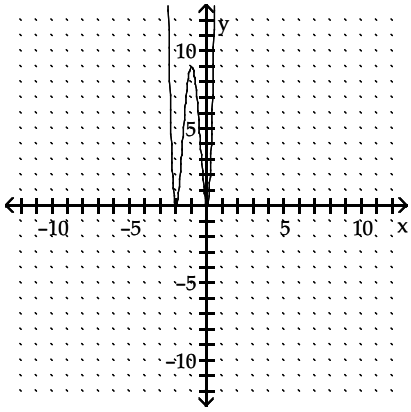
6) $f(x) = 3x(x + 2)^2$



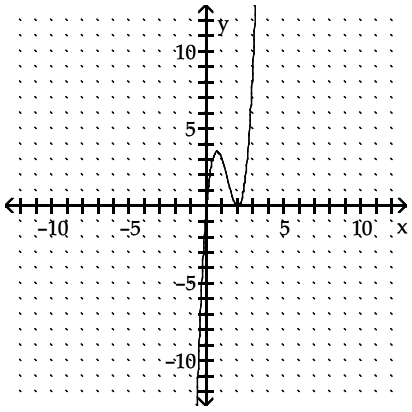
A)



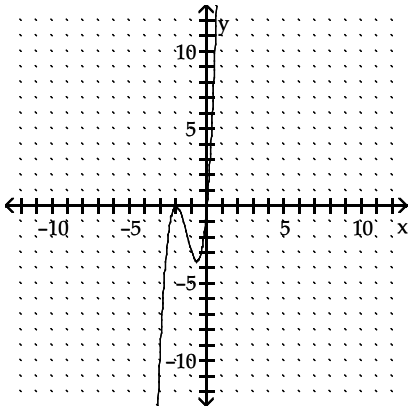
B)



C)

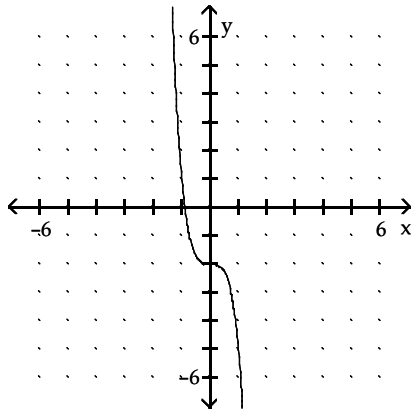


D)



Give the possible values for the degree of the polynomial and the sign (+ or –) of the x^n term.

7)



A) Degree is odd (3, 5, etc.);... x^n sign is negative.

B) Can't identify degree; x^n sign is negative.

C) Degree is even (2, 4, 6 etc.);... x^n sign is positive.

D) Degree is even (2, 4, 6, etc.);... x^n sign is negative.

Use synthetic division.

8) $(-3x^3 - 15x^2 + 21x + 18) \div (x + 6)$

A) $-3x + 3$

B) $3x^2 - 6x + 3$

C) $\frac{-1}{2}x^2 + \frac{-5}{2}x + \frac{7}{2}$

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

Use the factor theorem to decide whether or not the second polynomial is a factor of the first.

9) $5x^2 + 5x + 30;\ x - 3$

A) Yes

B) No

List the potential rational zeros of the polynomial function. Do not find the zeros.

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

A) $\pm\frac{1}{6}, \pm\frac{1}{3}, \pm\frac{1}{2}, \pm\frac{2}{3}, \pm 1, \pm 2, \pm 3$

B) $\pm\frac{1}{6}, \pm\frac{1}{3}, \pm\frac{1}{2}, \pm 1, \pm 2$

C) $\pm\frac{1}{2}, \pm\frac{3}{2}, \pm 1, \pm 2, \pm 3, \pm 6$

D) $\pm\frac{1}{6}, \pm\frac{1}{3}, \pm\frac{1}{2}, \pm\frac{2}{3}, \pm 1, \pm 2$

Give the equation of the specified asymptote(s).

11) Horizontal asymptote: $h(x) = \frac{3x^2 - 9x - 4}{5x^2 - 4x + 8}$

A) None

B) $y = \frac{9}{4}$

C) $y = 0$

D) $y = \frac{3}{5}$

12) Vertical asymptote(s): $h(x) = \frac{(x - 6)(x + 7)}{x^2 - 9}$

A) $x = 6, x = -7$

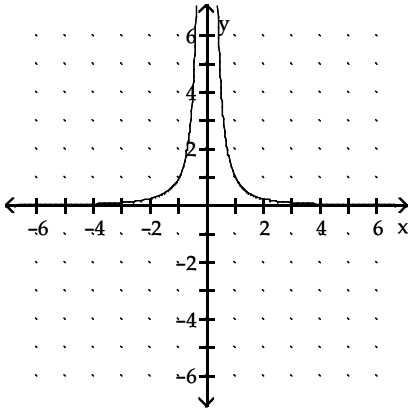
B) None

C) $x = -6, x = 7$

D) $x = 3, x = -3$

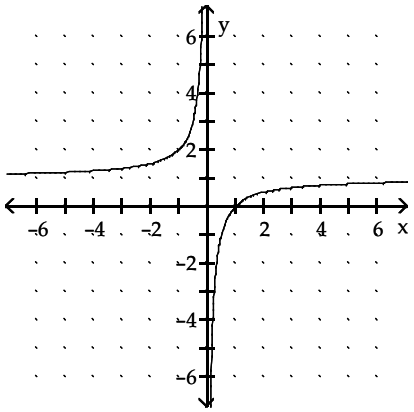
Match the correct function to a given graph.

13) Select the function given that matches the graph.



A) $f(x) = \frac{1}{x}$ B) $f(x) = \frac{1}{x^2}$ C) $f(x) = \frac{1}{2x}$ D) $f(x) = x^2$

14) Select the function given that matches the graph.

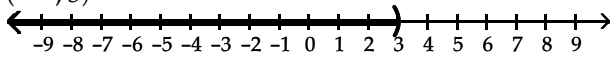


A) $f(x) = \frac{1}{x} - 1$ B) $f(x) = 1 + \frac{1}{x}$ C) $f(x) = 1 - x$ D) $f(x) = 1 - \frac{1}{x}$

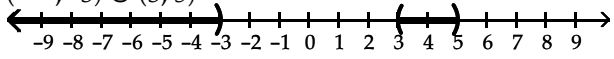
Solve the inequality.

15) $(a + 3)(a - 3)(a - 5) > 0$

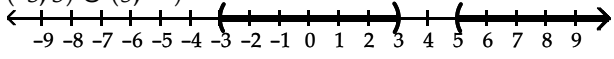
A) $(-\infty, 3)$



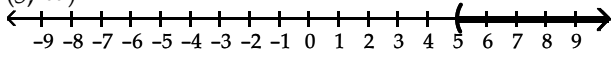
B) $(-\infty, -3) \cup (3, 5)$



C) $(-3, 3) \cup (5, \infty)$



D) $(5, \infty)$



Solve the inequality. Write answer in interval notation.

16) $\frac{3x}{6 - x} \geq 3x$

A) $[0, 5] \cup [6, \infty)$ B) $(-\infty, 5] \cup [6, \infty)$ C) $(-\infty, 0] \cup [5, 6)$ D) $[6, \infty)$

Write a general formula to describe the variation.

17) v varies directly with t; $v = 5$ when $t = 19$

A) $v = \frac{5}{19t}$ B) $v = \frac{19}{5}t$ C) $v = \frac{5}{19}t$ D) $v = \frac{19}{5t}$

18) A varies inversely with x^2; $A = 3$ when $x = 2$

A) $A = 6x^2$ B) $A = \frac{3}{4}x^2$ C) $A = \frac{6}{x^2}$ D) $A = \frac{12}{x^2}$

Solve the problem.

19) The time in hours it takes a satellite to complete an orbit around the earth varies directly as the radius of the orbit (from the center of the earth) and inversely as the orbital velocity. If a satellite completes an orbit 730 miles above the earth in 9 hours at a velocity of 38,000 mph, how long would it take a satellite to complete an orbit if it is at 1200 miles above the earth at a velocity of 29,000 mph? (Use 3960 miles as the radius of the earth.)

A) 3.02 hours B) 129.75 hours C) 19.39 hours D) 12.97 hours

Answer Key
Testname: STEST3.TST

1) C
2) A
3) B
4) D
5) D
6) D
7) A
8) D
9) B
10) D
11) D
12) D
13) B
14) D
15) C
16) C
17) C
18) D
19) D