MAC 1105 Module Test 12

Name_____

**MULTIPLE CHOICE.  Choose the one alternative that best completes the statement or answers the question.**

**Use analytical methods to solve the equation.**

1) $\dfrac{6}{x-6} = 1 + \dfrac{8}{x+6}$

    A) –8, 12            B) No solution           C) –10, 12          D) 10, –12

**Give the equations of any horizontal symptotes for the graphs of the rational functions.**

2) $g(x) = \dfrac{x^2 + 3x - 9}{x - 9}$

    A) y = 2            B) y = –3            C) None           D) y = 9

**Give the equations of any vertical symptotes for the graphs of the rational functions.**

3) $f(x) = \dfrac{x - 3}{x^2 + 4x}$

    A) x = 3            B) x = –4           C) x = 4          D) x = 0, x = –4

4) $g(x) = \dfrac{x - 8}{(x - 1)(x + 4)}$

    A) x = –8          B) x = 8           C) x = –1, x = 4       D) x = 1, x = –4

**Solve the problem.**

5) In the following formula, y is the minimum number of hours of studying required to attain a test score of x:

    $y = \dfrac{0.39x}{100.5 - x}$.  How many hours of study are needed to score 86? Round to the nearest hundredth if

    necessary.

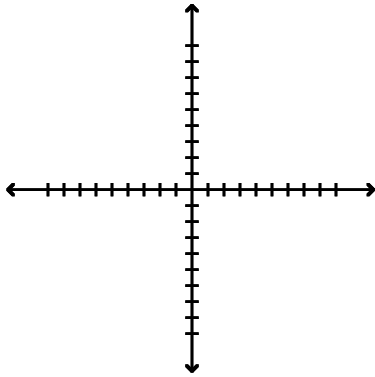    A) 101.04 hr        B) 5.57 hr          C) 23.10 hr        D) 2.31 hr

**For the given rational function, find all values of x for which y has the indicated value.**
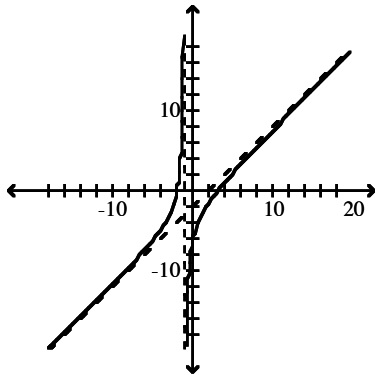
6) $y = 10x + \dfrac{12}{x};\quad y = 23$

    A) $\dfrac{5}{3}, \dfrac{1}{2}$           B) $\dfrac{3}{5}, 2$           C) $\dfrac{2}{3}, \dfrac{5}{4}$          D) $\dfrac{3}{2}, \dfrac{4}{5}$

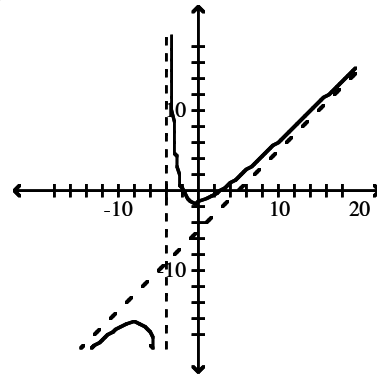**Graph the function.**

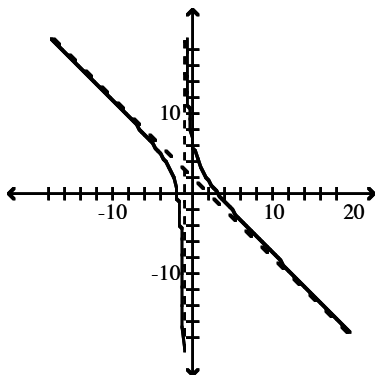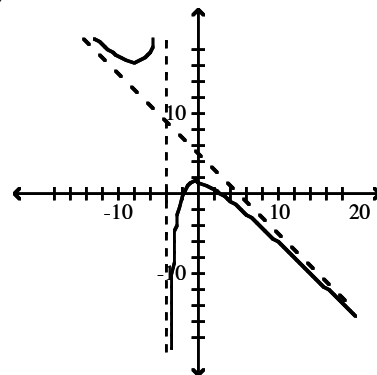7) $f(x) = \dfrac{x^2 - x - 6}{x + 4}$

A)

B)

C)

D)

**Solve the problem.**

8) The average number of vehicles waiting in line at a toll booth of a super highway is modeled by the function

$n(x) = \dfrac{x^2}{0.5(1 - x)}$, where x is a quantity between 0 and 1 known as the traffic intensity. To the nearest tenth,

find the average number of vehicles waiting if the traffic intensity is .81.
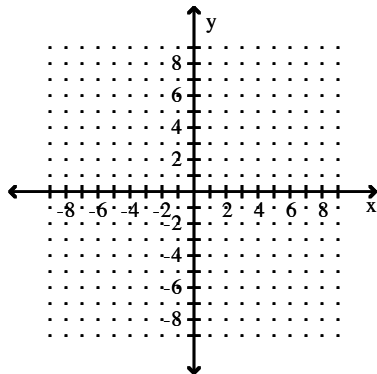
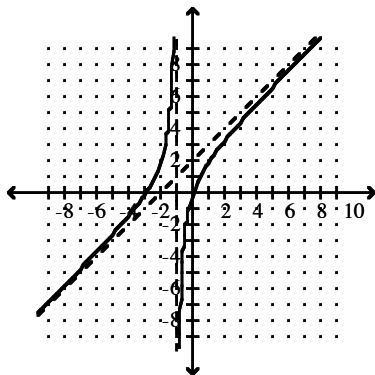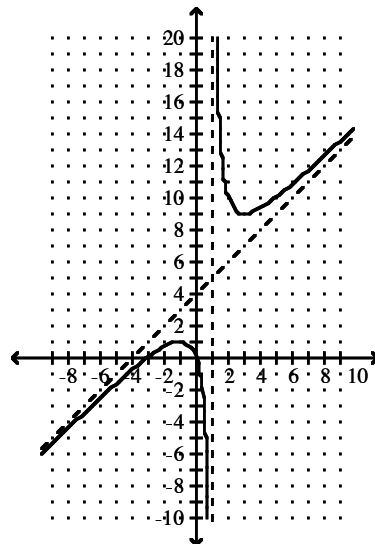A) 6.9 vehicles           B) 1.6 vehicles           C) 3.5 vehicles           D) 8.5 vehicles
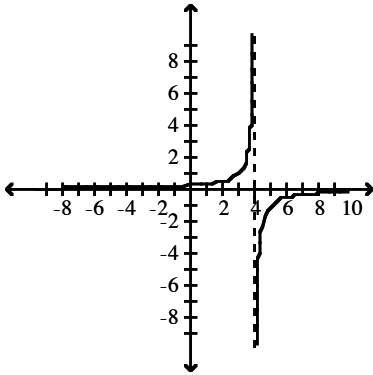
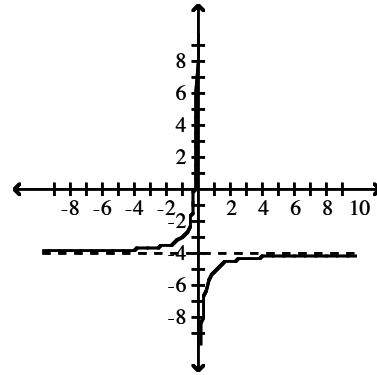**Graph the function.**

9) $f(x) = \dfrac{x^2 + 3x}{x - 1}$



A)



B)



C)
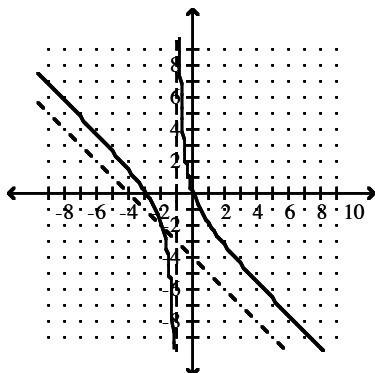


D)
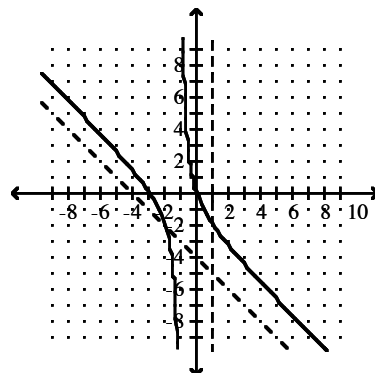
10) $f(x) = \dfrac{4x + 1}{x}$
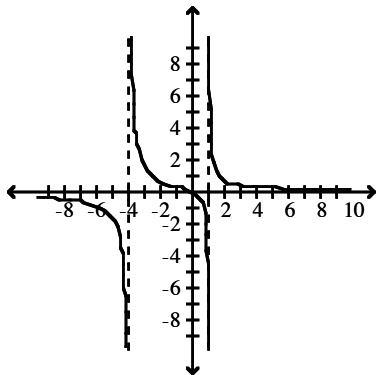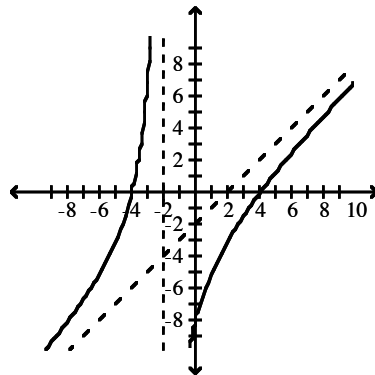
A)

B)

C)

D)

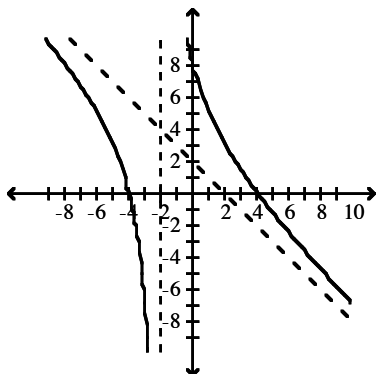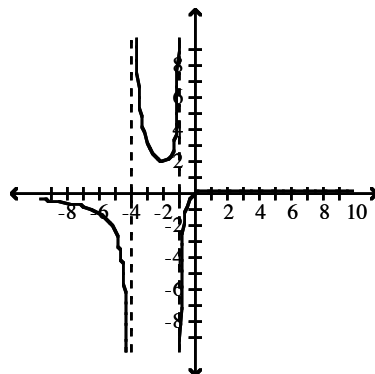11) $f(x) = \dfrac{x^2 - 16}{x + 2}$

4

A)

B)

C)

D)
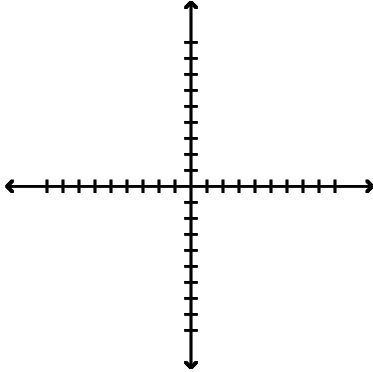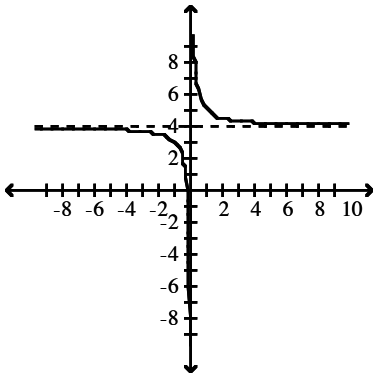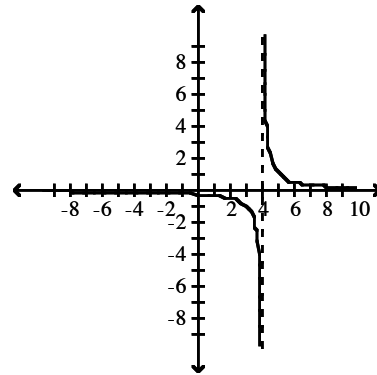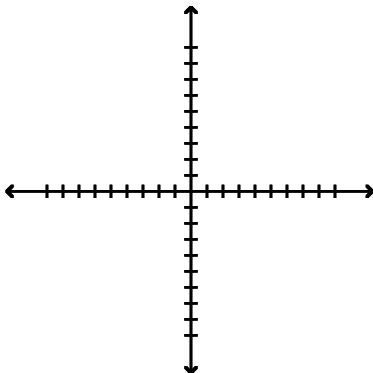
**Solve the problem.**

12) If the average cost per unit C(x) to produce x units of plywood is given by $C(x) = \dfrac{1200}{x + 40}$, what is the unit

cost for 10 units?  Round to the nearest cent.
A) $120.00                 B) $3.00                 C) $80.00                 D) $24.00

**For the given rational function, find all values of x for which y has the indicated value.**

13) $y = \dfrac{14}{x} - \dfrac{14}{2x}; \quad y = 8$

A) $\dfrac{9}{8}$                 B) $\dfrac{11}{4}$                 C) $\dfrac{7}{8}$                 D) $\dfrac{21}{8}$

**Use analytical methods to solve the equation.**

14) $\dfrac{5 - x}{x} + \dfrac{3}{4} = \dfrac{7}{x}$

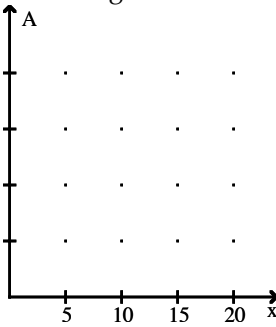A) –8                 B) –4                 C) $\sqrt{\dfrac{29}{20}}$                 D) 8
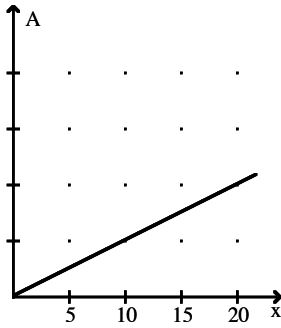
**Solve the problem.**

15) Suppose that the total-cost function for a certain company to produce x units of a product is given by
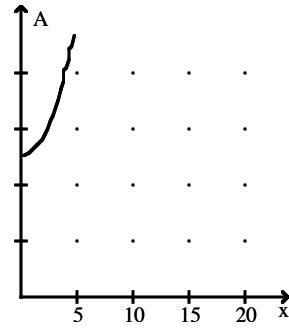$C(x) = 2x^2 + 50$.
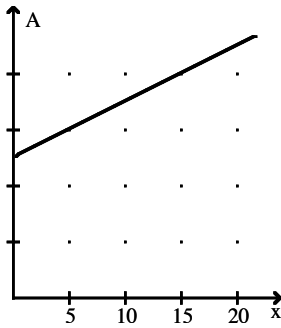
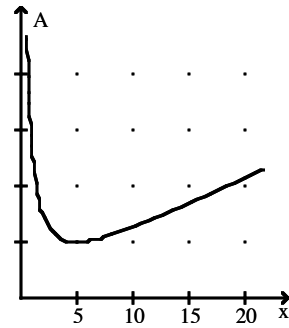Graph the average cost function $A(x) = C(x)/x$.



A)



B)



C)



D)



**For the given rational function, find all values of x for which y has the indicated value.**

16) $y = 3x + \dfrac{18}{x}$;  $y = 15$
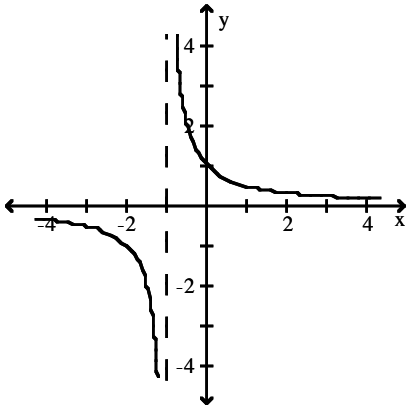
A) $\dfrac{1}{2}$, 3              B) – 2, –3              C) 1, 6              D) 2, 3
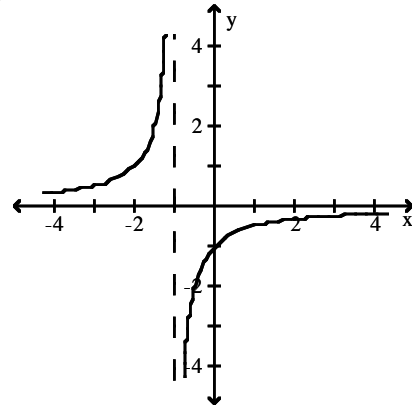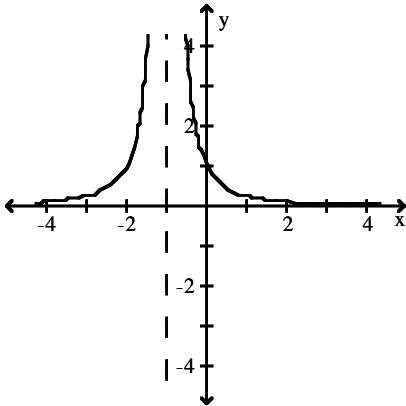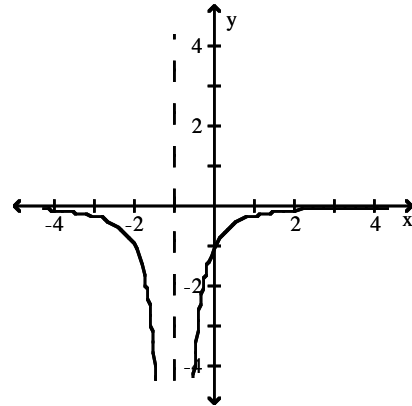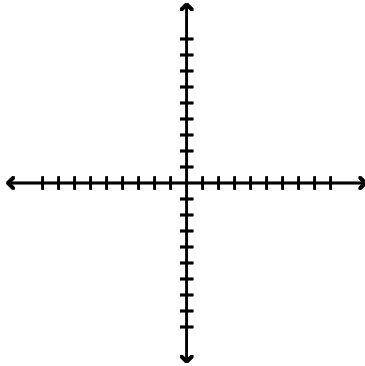
**Graph the function.**
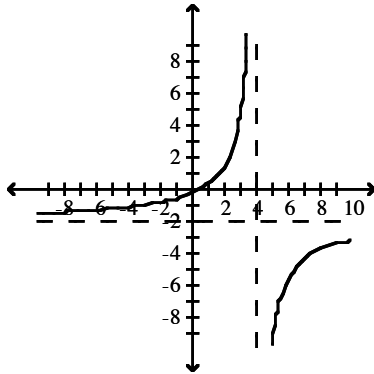
17) $f(x) = \dfrac{-1}{(x+1)2}$
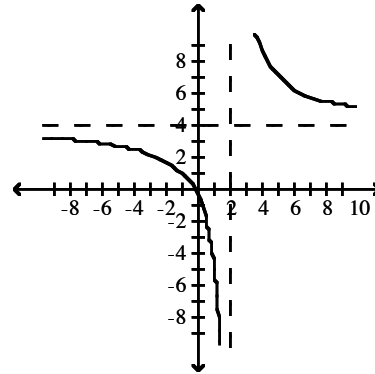
A)



B)



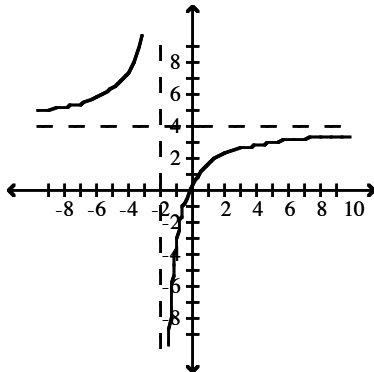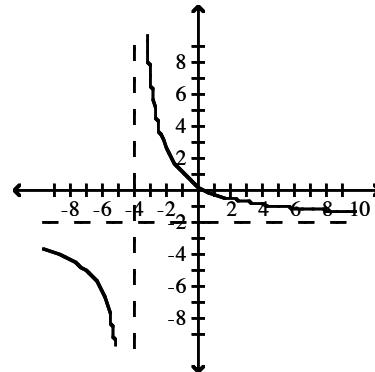C)



D)

18) $f(x) = \dfrac{4x + 1}{x - 2}$

A)

B)

C)

D)

**Give the equations of any vertical symptotes for the graphs of the rational functions.**

19) $f(x) = \dfrac{4x^3 + 3x - 3}{x^2 + 6x - 27}$

A) $y = 4$       B) $x = -3, x = 9$       C) $x = 3, x = -9$       D) $y = 3, y = -9$

**Use analytical methods to solve the equation.**

20) $\dfrac{x + 5}{x - 2} = 7$

A) $\dfrac{19}{6}$       B) $-\dfrac{9}{8}$       C) No solution       D) $\dfrac{3}{2}$