Math 1130 Exam 1 Review

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

1) Solve: $x = 2x - (6 - x)$ 1) _____

2) Solve: $\frac{6y}{7} = -\frac{3}{5}$ 2) _____

3) Solve: $\frac{3}{2}(4x - 3) = 2[x - (4x - 3)]$ 3) _____

4) Solve the equation: $1.4(0.2x + 1.3) = 0.5(0.1x + 4.56)$ 4) _____

5) Solve the equation $S = P(1 + rt)$ for t. 5) _____

6) Solve: $2x^2 - 9x + 4 = 0$ 6) _____

7) Solve: $(10 - 2x)(5 - x) = 50$ 7) _____

8) Suppose the weekly revenue for a company is given by $r = -2p^2 + 400p$ where p is the price of their product. What is the price of their product if the weekly revenue is \$18,750? 8) _____

9) Solve: $3(4x - 1) \geq 2(x + 4)$ 9) _____

10) Solve: $\frac{t - 1}{4} + 3 > \frac{t}{3}$ 10) _____

11) Solve: $0.3[3 - 2x] \geq 4[1 - 0.3x]$ 11) _____

12) A manufacturer has 4000 units of product x in stock and is now selling it at \$10 per unit. Next month the unit price will increase by \$2. The manufacturer wants the total revenue received from the sale of the 4000 units to be no less than \$45,000. What is the maximum number of units that can be sold this month? 12) _____

13) A pet food company needs to calculate how much to charge for a bag of rabbit food that costs \$10 to produce. The fixed costs involved in production are \$15,000. They want to start making a profit after they have sold 4,000 bags of rabbit food. What is the least amount they can charge to make this goal? 13) _____

14) Car rental company A rents a compact car for \$32 per day, while rental company B rents an equivalent car for \$21 per day plus an initial fee of \$55. If a customer wants the cheaper rate, when should he rent from company B? 14) _____

15) If $g(x) = \frac{x}{x-4}$, find: 15) _____

(a) the domain
(b) $g(0)$
(c) $g(-4)$
(d) $g\left(\frac{1}{2}\right)$
(e) $g(x^2)$

16) Find the domain of the function: $f(x) = \frac{\sqrt{x-1}}{x^2-9}$ 16) _____

17) If $f(x) = 3x - 1$, find $\frac{f(x+h) - f(x).}{h}$ 17) _____

18) If $f(x) = x^2 + 2x - 6$, find $\frac{f(x+h) - f(x).}{h}$ 18) _____

19) 19) _____

Given the function $F(x) = \begin{cases} 2 + x, \text{ if } x > 3 \\ 5, \text{ if } x = 2 \\ 4 - x, \text{ if } x < 2 \end{cases}$,

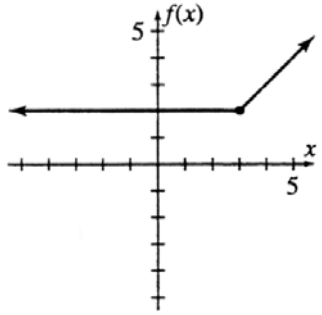
find:
(a) the domain
(b) $F(2)$
(c) $F(-2)$
(d) $F(5)$

20) If $f(x) = 2x + 3$ and $g(x) = 3x - 2$, find: 20) _____
(a) $(f \circ g)(x)$
(b) $(g \circ f)(x)$

21) Traci earns $15.00 per hour and Rich earns $18.00 per hour. 21) _____
(a) Write a function $t(x)$ for Traci's earnings as a function of hours worked.
(b) Write a function $r(x)$ for Rich's earnings as a function of hours worked.
(c) Assuming they work the same number of hours each week, write a function $(t + r)(x)$ for their combined earnings as a function of hours worked.

22) The graph of $y = f(x)$ is shown below. Estimate: 22) _____

(a) $f(-1)$
(b) $f(0)$
(c) $f(2)$
(d) $f(3)$
(e) What is the domain of f?
(f) What is the range of f?



23) Find the equation of the line with y–intercept 4 and slope $-\frac{2}{3}$. 23) _____

24) Find a general linear equation of the line that passes through the points (4, –3) and (6, –7). 24) _____

25) Determine an equation of the vertical line that passes through the point (3, –6). 25) _____

26) Find an equation of the horizontal line that passes through the point (5, 6). 26) _____

27) Find the slope–intercept form of the line that passes through (2,–3) and (–4,7). 27) _____

28) Suppose f is a linear function with slope 5 and such that $f(1) = 4$. Find $f(x)$. 28) _____

29) Suppose f is a linear function such that $f(-2) = 5$ and $f(5) = 2$. Find $f(x)$. 29) _____

30) Suppose that a manufacturer will place 1000 units of a product on the market when the price is \$10 per unit, and 1400 units when the price is \$12 per unit. Find the supply equation for the product assuming the price p and quantity q are linearly related. 30) _____

31) Suppose the cost to produce 100 units of a product is \$5000, and the cost to produce 125 units is \$6000. If cost c is linearly related to output q, find an equation relating c and q. 31) _____

32) The demand per week for a new automobile is 400 units when the price is \$16,700 each, and 500 units when the price is \$14,900 each. Find the demand equation for the cars, assuming that it is linear. 32) _____

33) The demand function for an appliance company's line of washing machines is $p = 300 - 5q$, where p is the price (in dollars) per unit when q units are demanded (per week) by consumers. Find the level of production that will maximize the manufacturer's total revenue, and determine this revenue. 33) _____

1) $x = 3$
2) $y = -\frac{7}{10}$
3) $x = \frac{7}{8}$
4) $x = 2$
5) $t = \frac{S - P}{Pr}$
6) $x = 4, \frac{1}{2}$
7) $x = 0, 10$
8) The price is \$75 or \$125.
9) $x \geq \frac{11}{10}$
10) $t < 33$
11) $x \geq 5.167$
12) 1500
13) \$13.75 per bag
14) The rates are the same for a 5 day rental. Use company B when renting for more than 5 days.
15) (a) all real numbers except 4
    (b) 0
    (c) $\frac{1}{2}$
    (d) $-\frac{1}{7}$
    (e) $\frac{x^2}{x^2 - 4}$
16) all real numbers ≥ 1 except 3
17) 3
18) $2x + h + 2$
19) (a) $x \leq 2 \cup x > 3$
    (b) 5
    (c) 6
    (d) 7
20) (a) $6x - 1$ (b) $6x + 7$
21) (a) $t(x) = 15x$
    (b) $r(x) = 18x$
    (c) $(t + r)(x) = 33x$
22) (a) 2
    (b) 2
    (c) 2
    (d) 2
    (e) all real numbers
    (f) all real numbers greater than or equal to 2
23) $y = -\frac{2}{3}x + 4$
24) $2x + y - 5 = 0$

25) $x = 3$
26) $y = 6$
27) $y = -\frac{5}{3}x + \frac{1}{3}$
28) $5x - 1$
29) $y = -\frac{3}{7}x + \frac{29}{7}$
30) $p = \frac{1}{200}q + 5$
31) $c = 40q + 1000$
32) $p = -18q + 23{,}900$
33) 30 units; $4500 maximum revenue