

1) $C(x) = 75 + 50x$ Answer: 2

★ 75 → Fixed Rate ★
50 → Cost per hour
x → # of hours worked

2) Answer: 1

4 gallons → \$15 dollars
8 gallons → \$30 dollars

$$m = \frac{30 - 15}{8 - 4} = \frac{15}{4} = \frac{3.75}{1}$$

(0,0) on graph so b=0

$$f(x) = mx + b$$

$$f(x) = 3.75x + 0$$

$f(x) = 3.75x$

3) Answer: 3

$$y = 1000(1.02)^{4(1)} = 1082.43$$

$$y = 1000(1.02)^{4(12)} = 2587.07$$

$$2587.07 - 1082.43 = \boxed{1504.64}$$

4) Answer: 1

$$\frac{I}{Pr} = \frac{P_r T}{P_r}$$

$\frac{I}{Pr} = t$

8) Answer: 1

$$f(x) = 150(1.04)^x$$

4% growth rate would mean

$$150(1 + .04)^x$$

$$150(1.04)^x$$

So #1 is incorrect

5) Answer: 2

$$f(x) = 3x^2 + 6x - 24$$

$$0 = \frac{3x^2}{3} + \frac{6x}{3} - \frac{24}{3}$$

$$0 = 3(x^2 + 2x - 8)$$

$$0 = 3(x-2)(x+4) \quad \begin{array}{l} \text{dif signs} \\ \text{Factors of 8} \end{array} \quad -1 + 8 = 7$$

$$3=0 \quad \begin{array}{l} x-2=0 \\ x=2 \end{array} \quad \begin{array}{l} x+4=0 \\ x=-4 \end{array} \quad \begin{array}{l} -2 + 4 = 2 \\ -2 + 4 = 2 \end{array} \quad \begin{array}{l} \text{Add to +2} \end{array}$$

6) Answer: 2

$$4x^2 + 16 = (4-2x)^2$$

$$4x^2 + 16 = (4-2)(4-2x)$$

$$4x^2 + 16 = (16 - 8x - 8x + 4x^2)$$

$$4x^2 + 16 = (16 - 16x + 4x^2)$$

$$\cancel{4x^2} + \cancel{16} - \cancel{16} + 16x - \cancel{4x^2}$$

$$16x$$

7) Answer: 3

$$\frac{x^4 - 9x^2}{x^2} \rightarrow \text{GCF } x^2$$

$$x^2(x^2 - 9)$$

$$\boxed{x^2(x-3)(x+3)}$$

9) Answer: 4

$$f(3) = 15(3) = 45$$

$$f(5) = 15(5) = 75$$

$$75 - 45 = 30 \text{ gallons more}$$

$$\frac{30}{45} \text{ (change/original)}$$

$$\frac{30}{45} = \boxed{67\%}$$

10) Answer: 2

$$(x-6)^2 = 32$$

$$(x-6)(x+6) = 32$$

$$x^2 - 6x - 6x + 36 = 32$$

$$x^2 - 12x + 36 = 32$$

$$-32 \quad -32$$

$$x^2 - 12x + 4 = 0$$

11) Answer: 4

Since the store cannot sell to negative or decimal customers the only acceptable choice from these 4 is option 4 which would result in $\{1, 2, 3, \dots\}$

12) Answer: 1

The only good option here is to eliminate the wrong answers.

$$\textcircled{1} f(2) = (f(1))^2 + 1 = 2^2 + 1$$

$$= 5 \checkmark$$

$$f(3) = (f(2))^2 + 1 = 5^2 + 1 \star$$

$$= 26 \checkmark$$

$$\textcircled{2} f(2) = 2 \cdot f(1) + 1 = 2 \cdot 2 + 1$$

$$= 5 \checkmark$$

$$f(3) = 2 \cdot f(2) + 1 = 2 \cdot 5 + 1 \times$$

$$= 11 \times$$

$$\textcircled{3} f(2) = f(1) + 4 = 2 + 4 \times$$

$$= 6 \times$$

$$\textcircled{4} f(2) = 2^{f(1)} + 1 = 2^2 + 1$$

$$= 5 \checkmark$$

$$f(3) = 2^{f(2)} + 1 = 2^5 + 1 \times$$

$$= 33 \times$$

13) Answer: 3

$$f(x) = |x| \rightarrow g(x) = |x+2| - 3$$

★ left 2 down 3 ★

14) Answer: (2.5, 3.5)

$$\star -3(2x + 4y = 19)$$

$$6x + 2y = 22$$

$$+ -6x - 12y = -57 \leftarrow$$

$$-10y = -35$$

$$\frac{-10}{-10} \quad \frac{-35}{-10}$$

$$y = 3.5$$

$$2x + 4(3.5) = 19$$

$$2x + 14 = 19$$

$$-14 \quad -14$$

$$\frac{2x}{2} = \frac{5}{2}$$

$$x = 2.5$$

* you can use any method, elimination is shown *

* This will give $-6x$ and $6x$ which will eliminate x

15) Answer: $f(x) = (x-4)^2 + 3$ vertex $\rightarrow (4, 3)$

$$f(x) = x^2 - 8x + 19$$

$$0 = x^2 - 8x + 19$$

$$-19 \quad -19$$

$$-19 = x^2 - 8x$$

$$\frac{-8}{2} = (-4)^2 = +16$$

$$-19 + 16 = x^2 - 8x + 16$$

$$-3 = (x-4)^2$$

$$+3 \quad +3$$

$$0 = (x-4)^2 + 3$$

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

$$\text{Vertex} \rightarrow (4, 3)$$

16) Answer: \$4.50

c → price of one cup of coffee

d → price of one doughnut

* $-8(10c + 14d = 23)$ 1st Friday

$10(8c + 20d = 25)$ 2nd Friday

* This will give us

$-80c - 112d = -184$ $-80c$ and $80c$

+ $80c + 200d = 250$

$88d = 66$

$\frac{88}{88} = \frac{66}{88}$

$d = .75$

$10c + 14(.75) = 23$

$10c + 10.5 = 23$

$-10.5 \quad -10.5$

$\frac{10c}{10} = \frac{12.5}{10}$

$c = 1.25$

$14(1.25) + 24(.75) = 35.50$

$40 - 35.5 = \underline{\underline{\$4.50}}$

17) Answer: Below ↓

$C(x) = .75x + 100$

* $.75$ is the cost that is paid per mile

* x is the # of miles driven

* 100 is the standard cost

18) Answers:

$$h(t) = -8t^2 + 64t + 5$$

$$t = \frac{-b}{2a}$$

$$t = \frac{-64}{2(-8)}$$

$$t = \frac{-64}{-16}$$

$t=4$ axis of symmetry
so this is t value
of vertex and time
of highest point

Since $t=4$ is the highest point
it stops rising here meaning from
0 through 4 seconds it is rising

$$0 < t < 4$$

$$t=7 \rightarrow -8(7)^2 + 64(7) + 5 = 61$$

$$t=8 \rightarrow -8(8)^2 + 64(8) + 5 = 5$$

$t=9 \rightarrow -8(9)^2 + 64(9) + 5 = -67$ * we know the rock
can't go below zero so
at 9 seconds it is back on
the ground, at 8, it is still 5
feet in the air.

19) $x \rightarrow$ # of cupcakes made/sold
 $y \rightarrow$ # of cookies made/sold

$$x + y \leq 200 \text{ (They can make up to 200 total)}$$

~~$$2.75x + 1.25y \geq 435$$~~

$$2.75x + 1.25y \geq 435 \text{ (They wish to make at least \$435)}$$

$$\begin{array}{r} x + y \leq 200 \\ -x \quad -x \\ \hline y \leq 200 - x \end{array}$$

$$\rightarrow m = -1$$

$$b = 200$$

$$\text{* solid line}$$

TEST (0,0)
 $0 \leq 200 - 0$
 $0 \leq 200 \checkmark$
* shade under

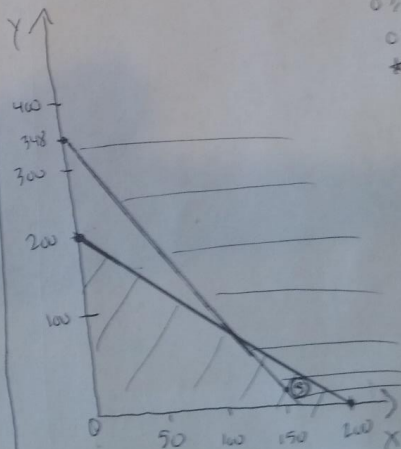
$$\begin{array}{r} 2.75x + 1.25y \geq 435 \\ -2.75x \quad -2.75x \\ \hline 1.25y \geq 435 - 2.75x \end{array}$$

$$\frac{1.25y}{1.25} \geq \frac{435 - 2.75x}{1.25}$$

$$y \geq 348 - \frac{11}{5}x \rightarrow m = -\frac{11}{5}$$

* $b = 348$
* solid line
TEST (0,0)
 $0 \geq 348 - \frac{11}{5}(0)$
 $0 \geq 348 \checkmark$
* shade over

* Very rough sketch *



* (80, 120) does not fall in the solution set
so they would not meet their goal