January 2015 Key

STOP! Are you sure you have done <u>everything</u> you can possibly do before you check your answers?

STOP! Do you only have a highlighter in your hand while making corrections? (No pens or pencils – fix the problem <u>after</u> you put the key away)

(1) 2	(9) 4	(17) . . . . . 4 . . . . .
(2) 2	(10) 2	(18) . . . . . 3 . . . . .
(3) 4	(11) 4	(19) . . . . . 4 . . . . .
(4) 1	(12) 2	(20) . . . . . 3 . . . . .
(5) 3	(13) 3	(21) . . . . . 1 . . . . .
(6) 2	(14) 4	(22) . . . . . 3 . . . . .
(7) 1	(15) 3	(23) . . . . . 4 . . . . .
(8) 1	(16) 1	(24) . . . . . 1 . . . . .

Scroll down for Part II, III, and IV answers

Part II – Show all work!

25. Patrick is correct. We know that 4.2 is rational because it can be written as a fraction and $\sqrt{2}$ is irrational because it can't be written as a fraction. A rational number plus an irrational number is irrational.

26. $\frac{\text{part}}{\text{whole}} = \frac{33+12}{180} = \frac{45}{180} =$

$0.25 =$

$\boxed{25\%}$

27. $(1,-4)$

In a function, each input has only 1 output. If the ordered pair $(-4,1)$ is added then the input -4 would have 2 outputs: 2 and 1.

If you add $(1,-4)$, the input 1 would only have 1 output: -4.

28. $(3x^2+8x-7)-(5x^2+2x-11)$

$3x^2+8x-7-5x^2-2x+11$

$\boxed{-2x^2+6x+4}$

29.

$4x^2 - 12x = 7$

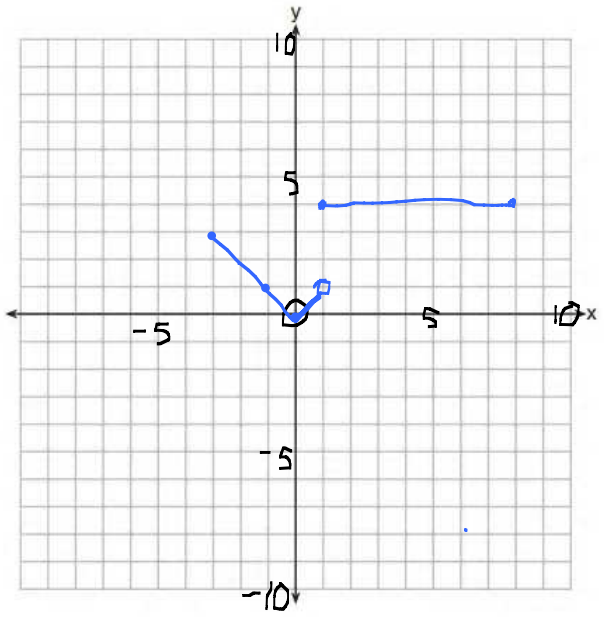
$4x^2 - 12x - 7 = 0$

$(2x - 7)(2x + 1) = 0$

$2x - 7 = 0$	$2x + 1 = 0$
$2x = 7$	$2x = -1$
$x = \frac{7}{2}$	$x = -\frac{1}{2}$

$\left\{\frac{7}{2}, -\frac{1}{2}\right\}$

30.



8 4

31.

3ft = 36 in.

4ft = 48 in.

$A(x) = 36 + 15x$

$B(x) = 48 + 10x$

$36 + 15x = 48 + 10x$

$-10x \quad -10x$

$36 + 5x = 48$

$-36 \quad -36$

$\frac{5x}{5} = \frac{12}{5}$

$x = 2.4$ yrs

32. a) $y = 0.25(2)^x$

OR

$y = 2^{x-2}$

b) I know that the y-values are doubling, so in the equation $y = a \cdot b^x$, $b = 2$. I know the initial value is 0.25, so $a = 0.25$. Therefore, $y = 0.25(2)^x$

OR

I created a lists and spreadsheets graph for the points (2,1), (3,2), (4,4) and (5,8), and did an exponential regression.

OR

I know the parent function is $p(x) = 2^x$ (b/c it doubles) and

it shifted right 2, so it became $y = 2^{x-2}$

Part III – Show all work!

33. a.) Let cost of one bag popcorn = p
Let cost of one drink = d

$2p + 3d = 18.25$
$4p + 2d = 27.50$

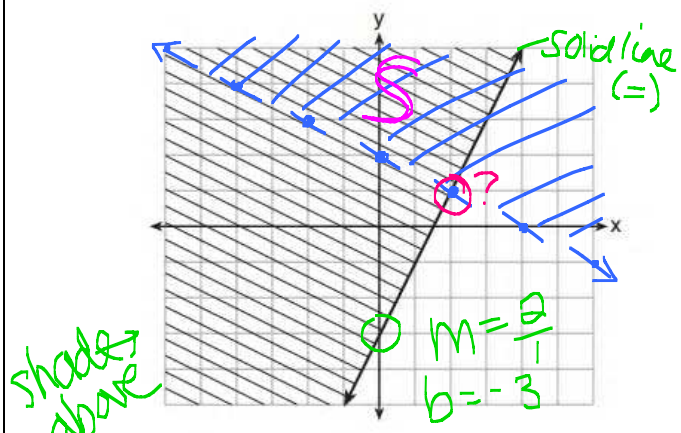
b.) $-2(2p + 3d = 18.25) \rightarrow -4p - 6d = -36.50$
$4p + 2d = 27.50$

$-4d = -9$
$d = \$2.25$

$2p + 3d = 18.25$
$2p + 3(2.25) = 18.25$
$2p + 6.75 = 18.25$
$2p = 11.50$
$p = 5.75$

One drink costs \$2.25
One bag of popcorn costs \$5.75

34.



a) $y \geq 2x - 3$

b) $x + 2y < 4$
$2y < 4 - x$
$y < 2 - \frac{1}{2}x$

c) Disagree.
(2,1) doesn't satisfy $x + 2y < 4$.

$x + 2y < 4$
$2 + 2(1) < 4$
$2 + 2 < 4$
$4 < 4$
(false)

35. a) $r = 0.94$

b) There is a strong, positive linear correlation between the two variables. As calories increase, so do the milligrams of sodium.

36. a) It represents a maximum because when $a < -1$, it reflects a quadratic function w/ a min. over the x-axis, making the vertex a max.

b) $f(x) = -x^2 + 8x + 9$

$f(x) = -1(x^2 - 8x + 16) + 9 + 16$

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

$\boxed{f(x) = -(x-4)^2 + 25}$

Part IV – show all work

37. a) Let length of square = x

Let length of new rectangle = $2x$

Let width of new rectangle = $x - 3$

Area of square = x^2

Area of new square = $1.25x^2$

$\boxed{2x(x-3) = 1.25x^2}$

b) This shows that the length of the square (x) is doubled to get the new length (2x) and decreased by 3 to get the new width (x-3). The area of the square (x^2) is multiplied by 1.25 ($1.25x^2$). Multiply the new length by the new width to get the new area.

c) $2x(x-3) = 1.25x^2$

$2x^2 - 6x = 1.25x^2$

$0.75x^2 - 6x = 0$

$0.75x(x-8) = 0$

$x = 0, x = 8$

$1.25x^2 = 1.25(8)^2 = 1.25(64) = \boxed{80\ m^2}$