1.	a and b	x-coordinate	y-coordinate	Vertex
a.	$a=1$ $b=-7$	$x=-\frac{b}{2a}$ $=-\frac{-7}{2(1)}$ $=3.5$	$y=3.5^2-7(3.5)+11$ $=-1.25$	$(3.5,-1.25)$
b.	$a=-2$ $b=-12$	$x=-\frac{b}{2a}$ $=-\frac{-12}{2(-2)}$ $=-3$	$y=-2(-3)^2-12(-3)-50$ $=-32$	$(-3,-32)$
c.	$a=1$ $b=-8$	$x=-\frac{b}{2a}$ $=-\frac{-8}{2(1)}$ $=4$	$y=4^2-8(4)-9$ $=-25$	$(4,-25)$
d.	$y=(3x+8)^2$ $=9x^2+48x+64$ $a=9$ $b=48$	$x=-\frac{b}{2a}$ $=-\frac{48}{2(9)}$ $=-8/3$	$y=\left(3\left(-\frac{8}{3}\right)+8\right)^2$ $=0$	$\left(-8/3,0\right)$

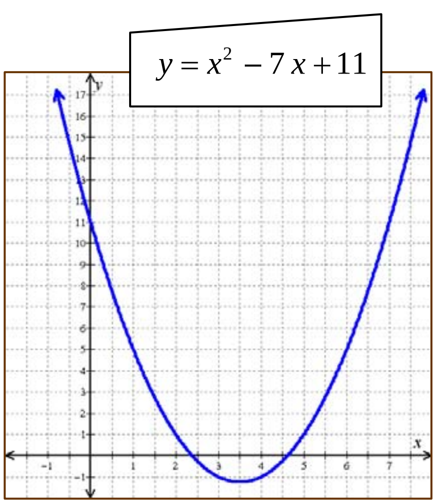
Please note: Fractional answers would be fine and dandy for question 1 (a). Decimal answers would not be acceptable for 1 (d) because the decimals would not be exact.

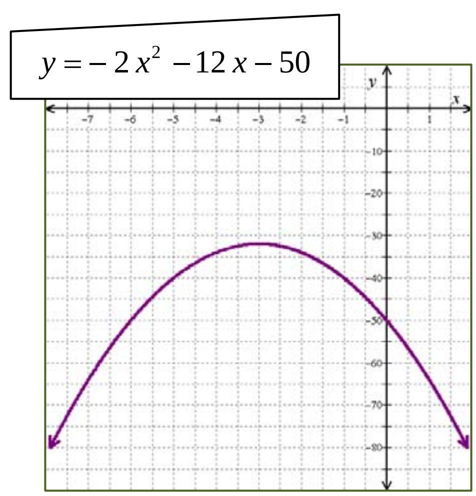
2. Find the intercepts of each parabola.

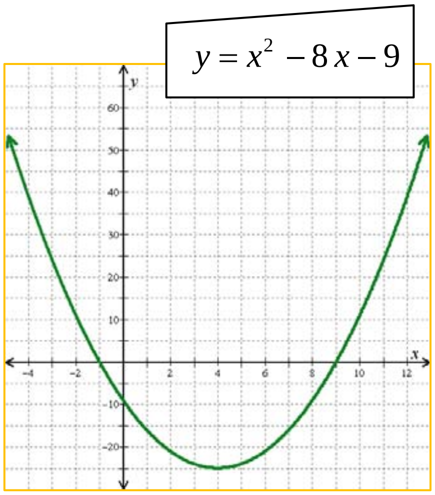
a.	$x^2-7x+11=0$ $a=1$ $b=-7$ $c=11$	$x=\frac{-(-7)\pm\sqrt{(-7)^2-4(1)(11)}}{2(1)}$ $=\frac{7\pm\sqrt{5}}{2}$	The x-intercepts are: $\left(\frac{7+\sqrt{5}}{2},0\right)$ and $\left(\frac{7-\sqrt{5}}{2},0\right)$. The y-intercept is $(0,11)$

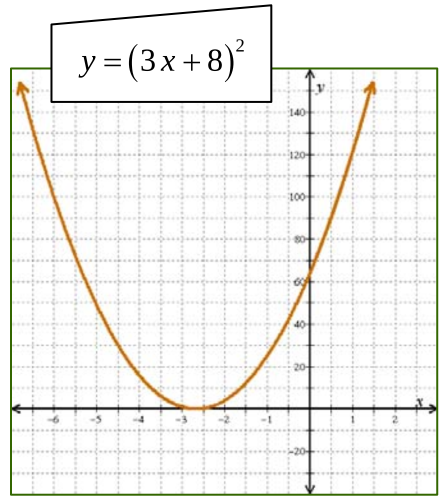
b.	$-2x^2-12x-50=0$ $-\frac{1}{2}\left(-2x^2-12x-50\right)=-\frac{1}{2}(0)$ $x^2+6x+25=0$ $a=1$ $b=6$ $c=25$	$x=\dfrac{-6\pm\sqrt{6^2-4(1)(25)}}{2(1)}$ $=\dfrac{-6\pm\sqrt{-64}}{2}$ These are not real numbers!!	There are no x-intercepts! The y-intercept is $(0,-50)$
c.	$x^2-8x-9=0$ $(x-9)(x+1)=0$ $x-9=0$ or $x+1=0$ $x=9$ or $x=-1$	The x-intercepts are $(9,0)$ and $(-1,0)$. The y-intercept is $(0,-9)$	
d.	$(3x+8)^2=0$ $3x+8=0$ $x=-8/3$	The only x-intercept is $\left(-8/3,0\right)$. When $x=0$, $y=(0+8)^2=64$. The y-intercept is $(0,64)$.	

3.









4. The maximum height reached by the pits can be determined by finding the vertex of the parabola $h(t) = -16t^2 + 32t + 48$.

$a = -16$ and $b = 32$ so the *t*-coordinate of the vertex is $t = -\dfrac{32}{2(-16)} = 1$. This tells us that it only took one second for the pita to reach its maximum height. The maximum height is determined by $h(1) = 64$. So the maximum height reached by the pita was 64 feet.

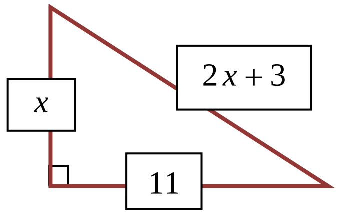
The pita hit the ground when $h(t) = 0$.

$$
\begin{aligned}
-16t^2 + 32t + 48 &= 0 \\
-\frac{1}{16}\left(-16t^2 + 32t + 48\right) &= -\frac{1}{16}(0) \\
t^2 - 2t - 3 &= 0 \\
(t-3)(t+1) &= 0
\end{aligned}
$$

$$t = 3 \text{ or } t = -1$$

Since the nasty pita didn't hit the ground before Abdou tossed it in the air, it must have take 3 seconds for the pita to reach the ground once it had been tossed by Abdou.

5. Let x represent the length of the unknown leg (measured in inches). Then the length of the hypotenuse is $2x+3$ and from the Pythagorean Theorem we get $x^2+11^2=(2x+3)^2$.



$$\begin{aligned} x^2+11^2 &= (2x+3)^2 \\ x^2+121 &= 4x^2+12x+9 \\ 0 &= 3x^2+12x-112 \end{aligned}$$

$$a=3 \qquad b=12 \qquad c=-112$$

$$\begin{aligned} x &= \frac{-12 \pm \sqrt{12^2-4(3)(-112)}}{2(3)} \\ &= \frac{-12 \pm \sqrt{1488}}{6} \end{aligned}$$

$$\frac{-12+\sqrt{1488}}{6} \approx 4.4 \text{ and } \frac{-12-\sqrt{1488}}{6} \approx -8.4$$

Since the length of a right triangle leg surely can't be negative, the unknown leg length must be about 4.4 inches. This makes the hypotenuse length about 11.8 inches.

Check

$4.4^2+11^2=140.36$ and $11.8^2=139.24$

The answer checks … the numbers are not exactly the same because of our rounding.