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| QUADRATIC EQUATIONS |
| **Forms:** | **STANDARD FORM** | **VERTEX FORM** | **FACTORED FORM** |
| Format | y = ax2 + bx + c | y = a(x-h)2 + k | y = a(x-r1)(x-r2) |
|  |  |  |  |
| How to find x intercept, (also known as roots or zeroes) | use quadratic formula | $$\left(\left(\pm \sqrt{\frac{-k}{a}} + h\right) , 0\right)$$ | (r1,0) (r2,0) |
| How to find y intercept | (0,c) | (0, ah2+k) | (0, ar1r2) |
| How to find axis of symmetry | x = $\frac{-b}{2a}$ | x = h | x = $\frac{r\_{1 + r\_{2}}}{2}$ |
| How to find vertex | (xv,yv) let xv = $\frac{-b}{2a}$ , find yv by substituting xv into the equation | (h,k) | (xv,yv) let xv =$\frac{r\_{1 + r\_{2}}}{2}$, find yv by substituting xv into the equation |
| Vertical Compression or Expansion from y=x2? | if a >1 or a<-1 : expansionif -1<a<1 : compression | if a >1 or a<-1 : expansionif -1<a<1 : compression | if a >1 or a<-1 : expansionif -1<a<1 : compression |
| Opens up or down? | if a<0 : opens downif a>0 : opens up | if a<0 : opens downif a>0 : opens up | if a<0 : opens downif a>0 : opens up |
| Domain ? | all real numbers | all real numbers | all real numbers |
| Range ? | if a>0, y>yvif a<0, y<yv | if a>0, y>kif a<0, y<k | if a>0, y>yvif a<0, y<yv |
| Convert to standard form |  | Expand | Expand (FOIL) |
| Convert to vertex form | complete the square |  | convert to standard form, then complete the square |
| Convert to factored form | Factor, if possible | Expand to standard form, then factor, if possible |  |

ACTIVITY: Find the x- intercept(s), y- intercepts, axis of symmetry, and vertex of each function. State the vertical compression or expansion of each function, and the direction of its opening.

y= 2x2 + 4x - 10

y= -2(x-3)2 + 5

y = 2(x+3)(x-1)