

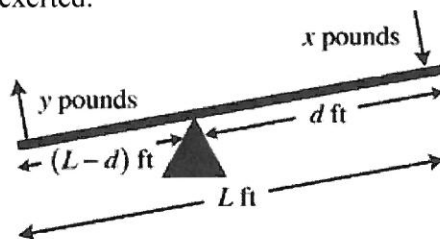
Discriminant, Literal Equations, Rational Expressions, and Graphing Quadratics Test

1. Solve $y = \frac{5}{8}b + 10$ for b . Show your work clearly.

$$\frac{8}{5}(y-10) = \frac{5}{8}b\left(\frac{8}{5}\right)$$

4pts. $\left. \begin{array}{l} \frac{8}{5}(y-10) = b \\ \frac{8}{5}y - 16 = b \end{array} \right\} \text{either is fine}$

2. When x pounds of force is applied to one end of a lever that is L feet long, the resulting force y on the other end is determined by the distance between the fulcrum (the lever's pivot) and the end of the lever on which the x pounds of force is exerted.



The formula relating the forces is $xd = y(L-d)$. What formula can you use to find the length of the lever? Show your work clearly.

$$\frac{xd}{y} = \frac{y(L-d)}{y}$$

$$\frac{xd}{y} = L - d + d$$

$$\frac{xd}{y} + d = L$$

a. $L = \frac{xd}{y} + d$

b. $L = \frac{xd+d}{y}$

c. $L = \frac{xd-yd}{y}$

d. $L = \frac{yd}{x} + d$

3. Calculate and use the discriminant to determine the number of real solutions of the equation.

$$4x^2 - 3x - 7 = 0. \text{ Show your work clearly.}$$

3pts. $D = 9 - 4(4)(-7)$

$$D = 9 + 112$$

$$D = 121$$

2 real solns

4. Write two quadratic equations of the form $ax^2 + bx + c = 0$, where $a \neq 0$, one of which has two real-number solutions and the other having no real solutions. Make sure to identify which is which. Explain why each equation has real solutions or no real solutions.

$$x^2 + 2x - 3 = 0$$

$$b^2 - 4ac = 4 - 4(1)(-3)$$

4pts. $D = 4 + 12$

$$D = 16 > 0$$

2 Real solutions
because $D > 0$

$$x^2 + 2x + 3 = 0$$

$$D = 4 - 4(1)(3)$$

$$D = -8$$

$$D < 0$$

No real solutions
because $D < 0$

4pts

Simplify the rational expression, if possible. Show your work clearly.

5. $\frac{n^2 + 8n + 15}{n^2 - 25}$. Please also state the excluded values.

$$n \neq \pm 5$$

4pts. $\frac{(n+5)(n+3)}{(n+5)(n-5)}$

$$\frac{n+3}{n-5}$$

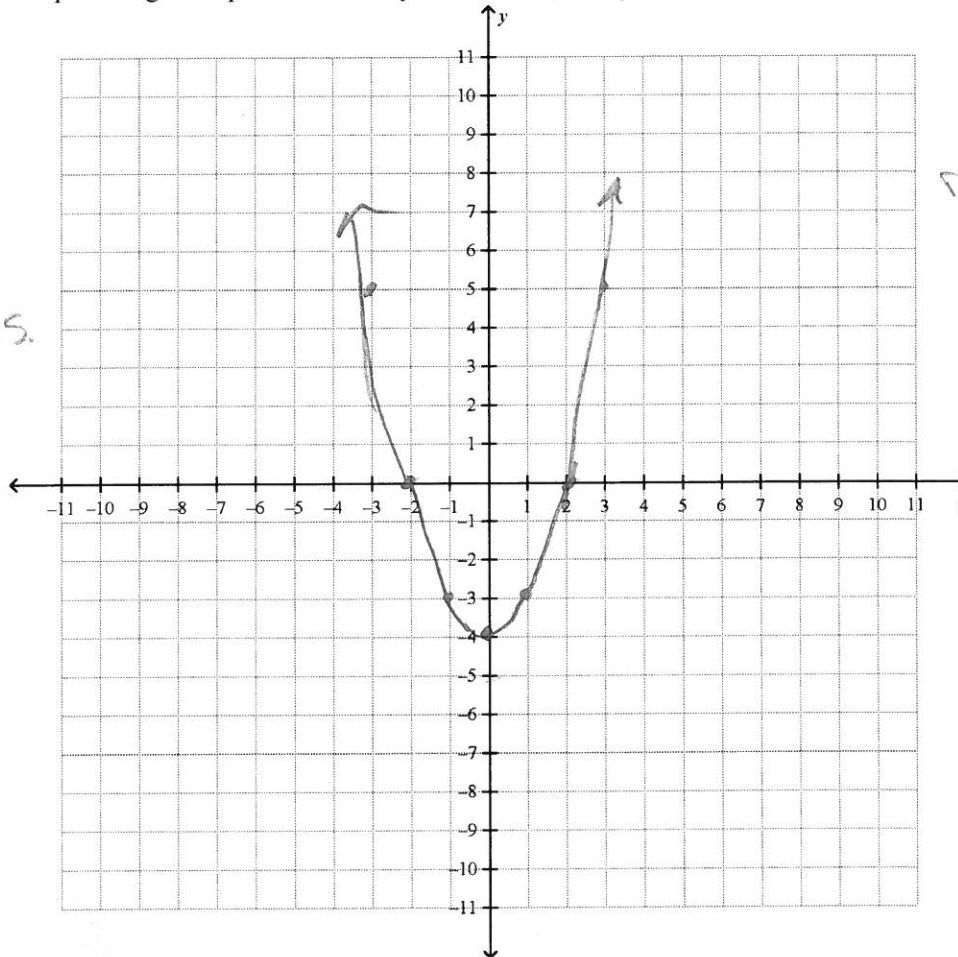
6. $\frac{x^2 - 4x + 4}{15x} \cdot \frac{x-2}{5x}$ Remember, a fraction bar means \div . You do not have to state excluded values.

5pts - $\frac{x^2 - 4x + 4}{15x} \cdot \frac{x-2}{5x}$

$$\frac{(x-2)(x-2)}{3 \cancel{15x}} \cdot \frac{\cancel{5x}}{(x-2)}$$

$$\boxed{\frac{x-2}{3}}$$

7. Graph using five points. Identify the roots (if they exist), the vertex, and the y-intercept. $y = x^2 - 4$



y-intercept = (0, -4)
 roots = ± 2
 vertex = (0, -4) 6pts

Name: _____

ID: A

Write in standard form and graph.

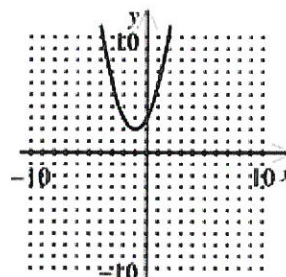
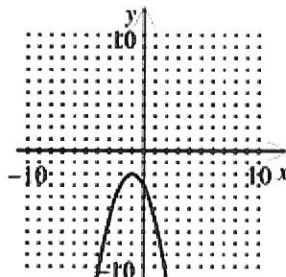
B

8. $y = (x-1)^2 + 2$

a. $y = -x^2 - 2x + 1$

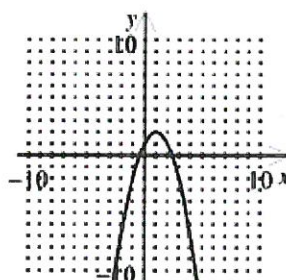
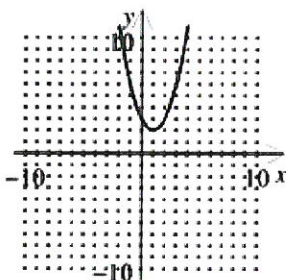
c. $y = x^2 + 2x + 3$

2pts.



b. $y = x^2 - 2x + 3$

d. $y = -x^2 + 2x + 1$



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