

Simplify.

$$1. \sqrt{16} = \sqrt{4 \cdot 4} = 2 \cdot 2$$

$$= \boxed{4}$$

$$2. \sqrt{120}$$

$$\sqrt{4 \cdot 30}$$

$$\sqrt{4} \cdot \sqrt{30}$$

$$= \boxed{2\sqrt{30}}$$

$$3. \sqrt{36} = \sqrt{9 \cdot 4} = \sqrt{9} \cdot \sqrt{4}$$

$$= 3 \cdot 2 = \boxed{6}$$

$$4. 4\sqrt{50} = 4\sqrt{25 \cdot 2}$$

$$4\sqrt{25} \cdot \sqrt{2}$$

$$4 \cdot 5 \cdot \sqrt{2}$$

$$= \boxed{20\sqrt{2}}$$

$$5. 2\sqrt{171}$$

$$2\sqrt{9 \cdot 19}$$

$$2\sqrt{9} \cdot \sqrt{19}$$

$$2 \cdot 3 \sqrt{19}$$

$$= \boxed{6\sqrt{19}}$$

$$6. 10\sqrt{720} = 10\sqrt{144 \cdot 5}$$

$$= 10\sqrt{144} \cdot \sqrt{5}$$

$$= 10 \cdot 12 \cdot \sqrt{5}$$

$$= \boxed{120\sqrt{5}}$$

$$7. \frac{\sqrt{36}}{2} = \frac{6}{2} = \boxed{3}$$

$$8. \frac{3\sqrt{72}}{15} = \frac{3\sqrt{36 \cdot 2}}{15}$$

$$= \frac{3\sqrt{36} \cdot \sqrt{2}}{15}$$

$$= \frac{3 \cdot 6\sqrt{2}}{15}$$

$$= \frac{18\sqrt{2}}{15} = \boxed{\frac{6\sqrt{2}}{5}}$$

$$9. \frac{4\sqrt{18}}{12} = \frac{4\sqrt{9 \cdot 2}}{12}$$

$$= \frac{4\sqrt{9} \cdot \sqrt{2}}{12}$$

$$= \frac{4 \cdot 3\sqrt{2}}{12}$$

$$= \frac{12\sqrt{2}}{12} = \boxed{\sqrt{2}}$$

$$10. \frac{6+2\sqrt{25}}{4}$$

$$\frac{6+2 \cdot 5}{4}$$

$$\frac{6+10}{4} = \frac{16}{4} = \boxed{4}$$

$$11. \frac{-6-\sqrt{243}}{3}$$

$$\frac{-6-\sqrt{81 \cdot 3}}{3}$$

$$\frac{-6-9\sqrt{3}}{3}$$

$$= \frac{-6}{3} - \frac{9\sqrt{3}}{3} = \boxed{-2-3\sqrt{3}}$$

$$12. \frac{8+4\sqrt{30}}{10} = \frac{8}{10} + \frac{4\sqrt{30}}{10}$$

$$= \boxed{\frac{4}{5} + \frac{2\sqrt{30}}{5}}$$

$$13. \frac{18+2\sqrt{216}}{25} = \frac{18+2\sqrt{36 \cdot 6}}{25}$$

$$= \frac{18+2 \cdot 6\sqrt{6}}{25}$$

$$= \frac{18+12\sqrt{6}}{25} = \boxed{\frac{18+12\sqrt{6}}{25}}$$

$$14. \frac{16+3\sqrt{16}}{7} = \frac{16+3 \cdot 4}{7}$$

$$= \frac{16+12}{7}$$

$$= \frac{28}{7} = \boxed{4}$$

$$15. \frac{-45-7\sqrt{225}}{30} = \frac{-45-7 \cdot 15}{30}$$

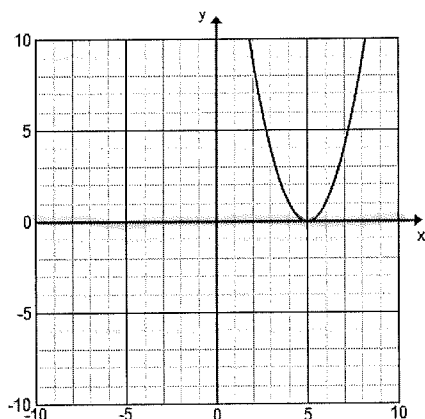
$$= \frac{-45-105}{30}$$

$$= \frac{-150}{30} = \boxed{-5}$$

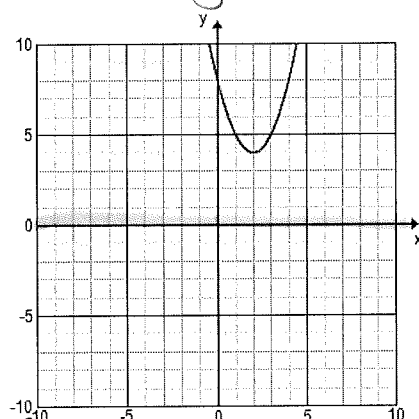
Key

16. Label each graph has having a positive, negative, OR zero discriminant.

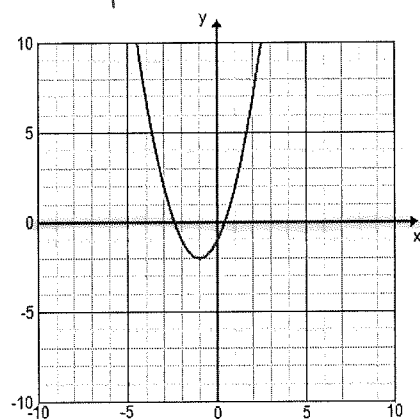
a) zero



b) negative



c) positive

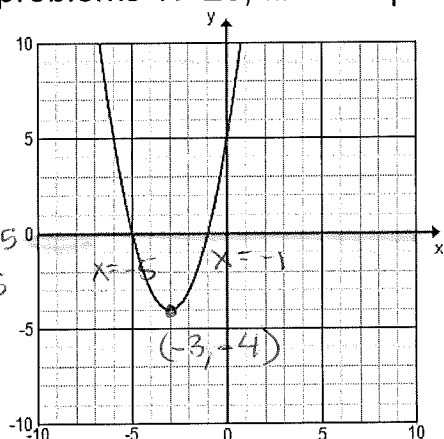


For problems 17-20, find the possible equation of the graph.

17.

$a=1$

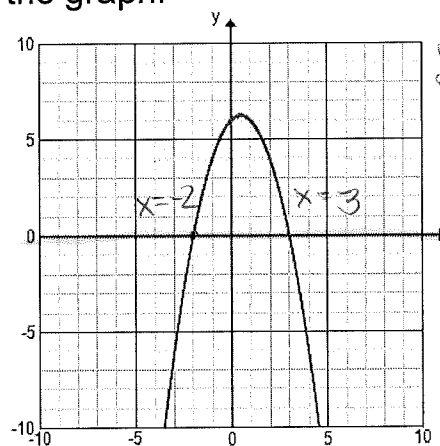
$$\begin{aligned} &1(x+5)(x+1) \\ &= x^2 + 5x + 1x + 5 \\ &= x^2 + 6x + 5 \end{aligned}$$



Possible Equation: $y = x^2 + 6x + 5$

19.

$a=-1$



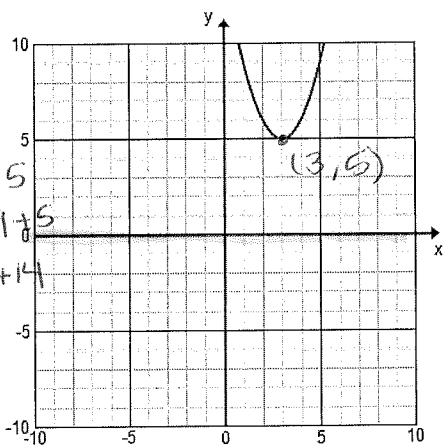
$$\begin{aligned} &y = -1(x+2)(x-3) \\ &= -1(x^2 + 2x - 3x - 6) \\ &= -1(x^2 - x - 6) \\ &= -x^2 + x + 6 \end{aligned}$$

Possible Equation: $y = -x^2 + x + 6$

18.

$a=1$

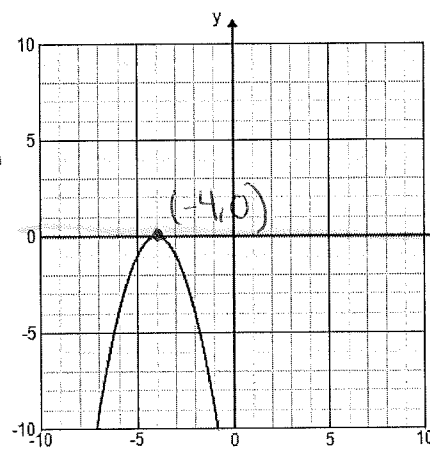
$$\begin{aligned} &y = 1(x-3)^2 + 5 \\ &= x^2 - 6x + 9 + 5 \\ &= x^2 - 6x + 14 \end{aligned}$$



Possible Equation: $y = x^2 - 6x + 14$

20.

$a=-1$



$$\begin{aligned} &y = -1(x+4)^2 + 0 \\ &= -1(x+4)(x+4) \\ &= -1(x^2 + 8x + 16) \\ &= -x^2 - 8x - 16 \end{aligned}$$

Possible Equation: $y = -x^2 - 8x - 16$