Classroom Voting Questions: Precalculus

Powers, Polynomials, and Rational Functions

1. Which of the following is not a power function?

   (a) $f(x) = 3x^2$
   (b) $f(x) = x^{1.5}$
   (c) $f(x) = 6 \cdot 2^x$
   (d) $f(x) = -3x^{-\pi}$

2. As $x \to \infty$, which function dominates? That is, which function is larger in the long run?

   (a) $0.1x^2$
   (b) $10^{10}x$

3. As $x \to \infty$, which function dominates?

   (a) $0.25\sqrt{x}$
   (b) $25,000x^{-3}$

4. As $x \to \infty$, which function dominates?

   (a) $3 - 0.9^x$
   (b) $\log x$

5. Which function dominates as $x \to \infty$?

   (a) x^2
   (b) e^x

6. As $x \to \infty$, which function dominates?

   (a) x^3
   (b) 2^x

7. As $x \to \infty$, which function dominates?

   (a) $10(2^x)$

   (b) $72,000x^{12}$

8. Which of these functions dominates as $x \to \infty$?

   (a) $f(x) = -5x$

   (b) $g(x) = 10^x$

   (c) $h(x) = 0.9^x$

   (d) $k(x) = x^5$

   (e) $l(x) = \pi^x$

9. If $f(x) = ax^2 + bx + c$ is a quadratic function, then the lowest point on the graph of $f(x)$ occurs at $x = -b/2a$.

   (a) True, and I am very confident.

   (b) True, but I am not very confident.

   (c) False, but I am not very confident.

   (d) False, and I am very confident.

10. Under what condition is the graph of the quadratic function described by $f(x) = ax^2 + bx + c$ concave down?

    (a) $a < 0$.

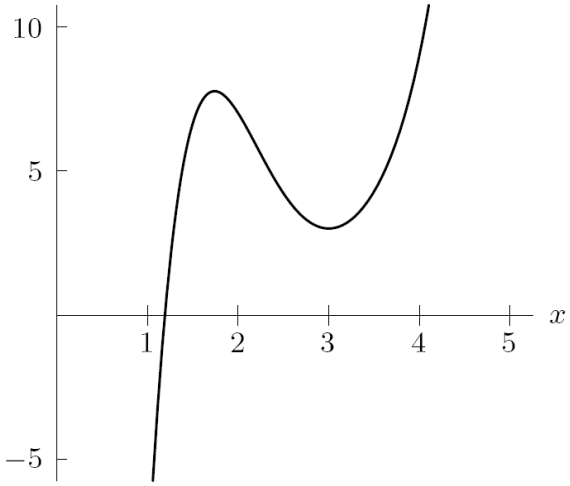
    (b) $b < 0$.

    (c) $c < 0$.

    (d) More than one of the above.

    (e) None of the above.

11. What is the degree of the graph of the polynomial in the figure below?



(a) 3

(b) 5

(c) Either (a) or (b)

(d) Neither (a) nor (b)

(e) Any polynomial of degree greater than 2

12. Which of the options below describes a function which is even?

(a) Any polynomial of even degree.

(b) Any polynomial of odd degree.

(c) $f(x) = 9x^6 - 3x^2 + 2$.

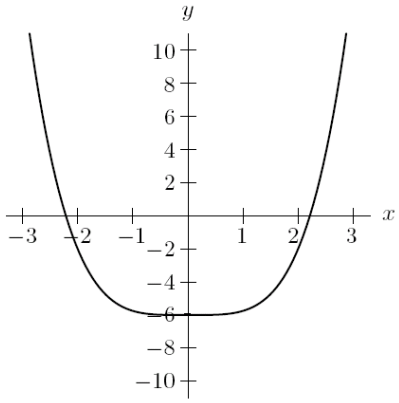
(d) $f(x) = 3x^4 - 2x^3 + x^2$.

(e) More than 1 of the above.

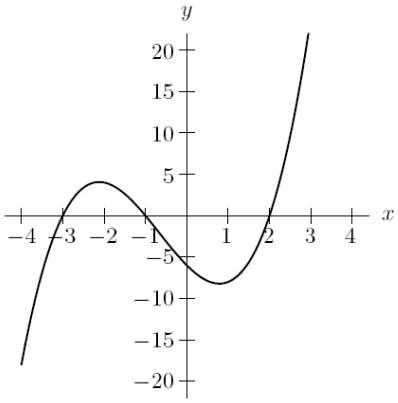
(f) None of the above.

13. The equation $y = x^3 + 2x^2 - 5x - 6$ is represented by which graph?

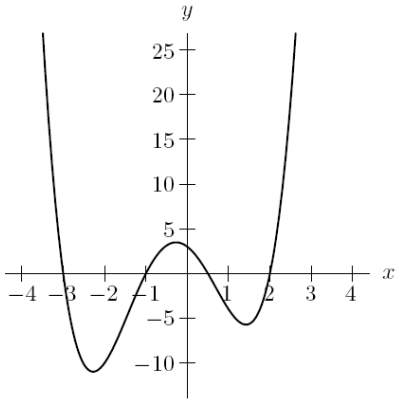
(a)



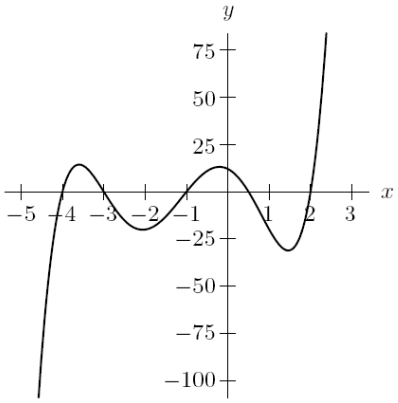
(b)



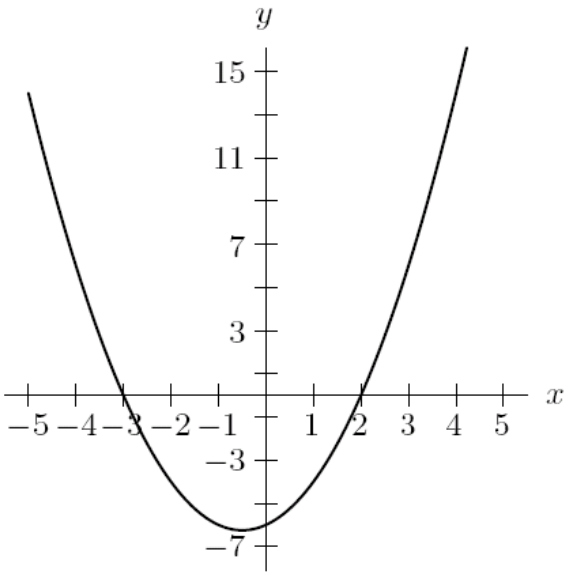
(c)



(d)



14. The graph below is a representation of which function?



(a) $y = 3x + 2$

(b) $y = (x - 2)(x + 3)$

(c) $y = (x - 6)(x - 2)$

(d) $y = (x - 3)(x + 2)$

(e) none of these

15. Let $f(x) = \frac{x^2-1}{x+1}$ and $g(x) = x - 1$, then $f(x) = g(x)$.

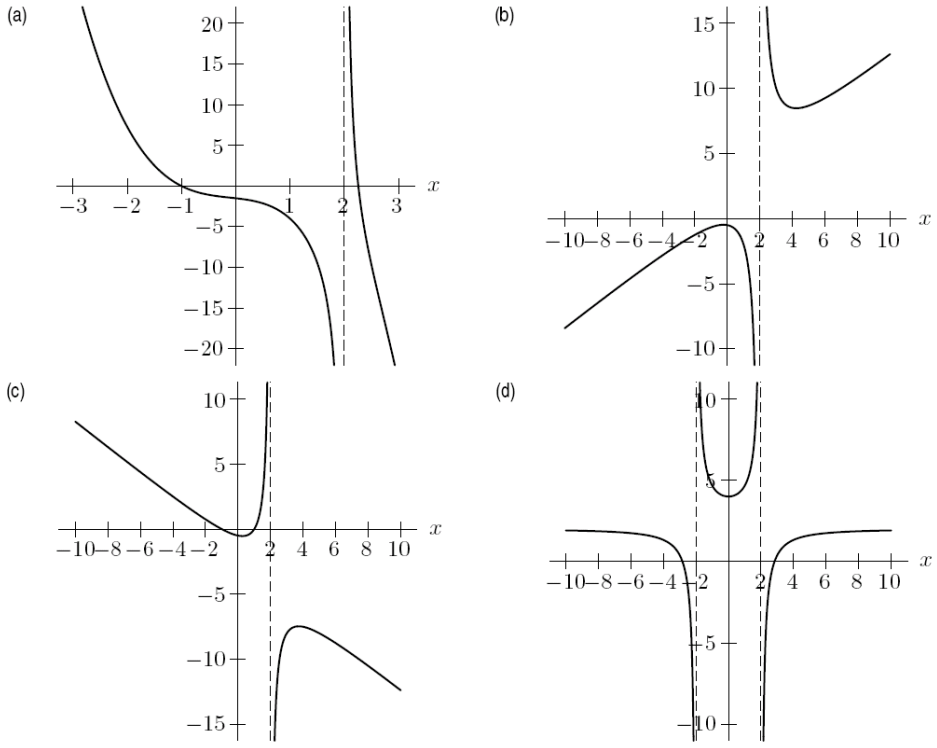
(a) True, and I am very confident

(b) True, but I am not very confident

(c) False, but I am not very confident

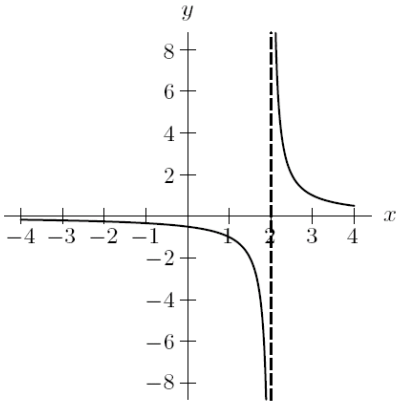
(d) False, and I am very confident

16. Which if the following is a graph for $y = \frac{1-x^2}{x-2}$. (No calculators allowed.)

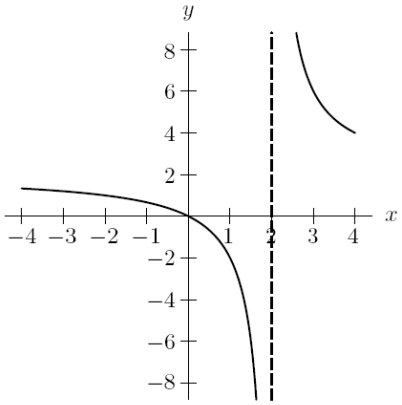


17. Which of the graphs represents $y = \frac{2x}{x-2}$?

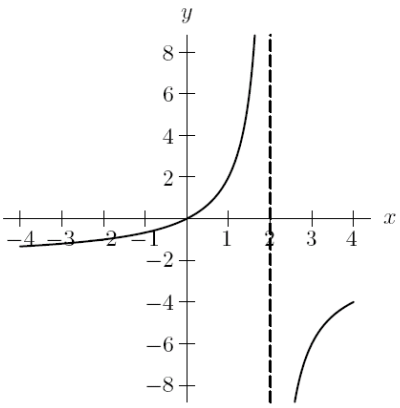
(a)


y
x
8
6
4
2
−4 −3 −2 −1 1 2 3 4
−2
−4
−6
−8

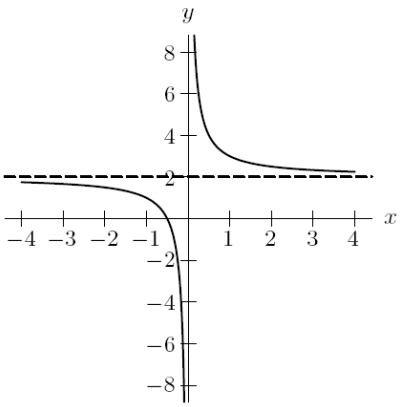
(b)


y
x
8
6
4
2
−4 −3 −2 −1 1 2 3 4
−2
−4
−6
−8

(c)


y
x
8
6
4
2
−4 −3 −2 −1 1 2 3 4
−2
−4
−6
−8

(d)


y
x
8
6
4
2
−4 −3 −2 −1 1 2 3 4
−2
−4
−6
−8