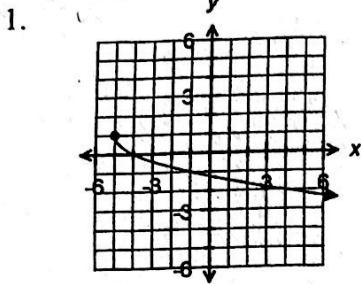


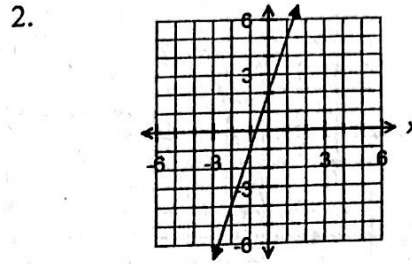
SM2 Units 1 – 3 Review

Find the domain and range of each function.



Domain: $[-5, \infty)$

Range: $(-\infty, 1]$



Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$

Find each value if $f(x) = x^2 + 4x - 5$ and $g(x) = 3x - 1$. Show all your work.

3. $f(-3)$
 $= (-3)^2 + 4(-3) - 5$
 $= 9 - 12 - 5$
 $= -8$

4. $g(-5)$
 $= 3(-5) - 1$
 $= -15 - 1$
 $= -16$

Do the following for the function below:

1. Identify the parent graph ($y = |x|$, $y = x^2$, or $y = \sqrt{x}$).
2. Fill in the x, y table for the parent graph.
3. Draw the graph of the parent graph with a dashed line.
4. List the transformations in the correct order.
5. Make a second x, y table to apply the reflections and stretches/compressions.
6. Make a third and final x, y table to apply the translations.
7. Draw the final graph with a solid line.
8. State the vertex, domain, and range of the final graph.

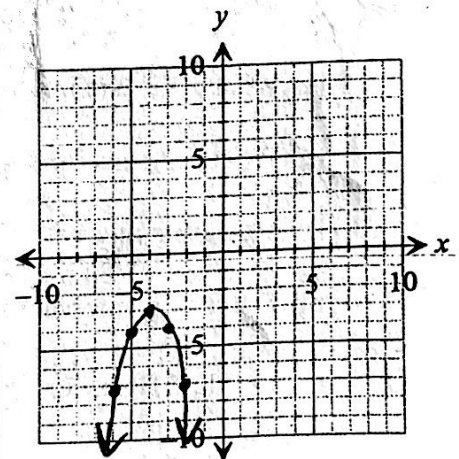
5. $y = -(x+4)^2 - 3$

Parent Graph: $y = x^2$

Transformations:

1. reflect over x -axis
2. shift left 4
3. shift down 3

-4	x	$y = x^2$	-1	-3	
-6	-2	4	-4	-7	
-5	-1	1	-1	-4	
-4	0	0	0	-3	
-3	1	1	-1	-4	
-2	2	4	-4	-7	

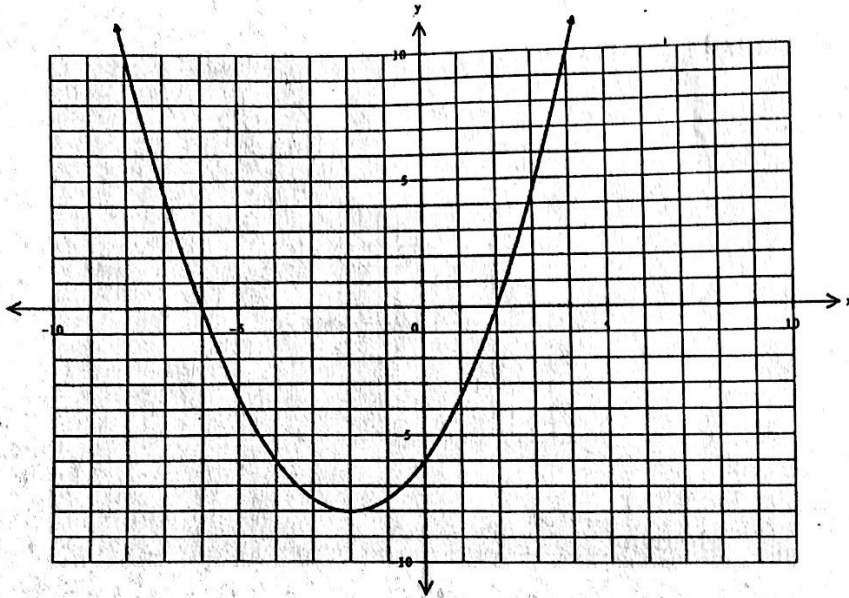


Vertex: $(-4, -3)$

Domain: $(-\infty, \infty)$

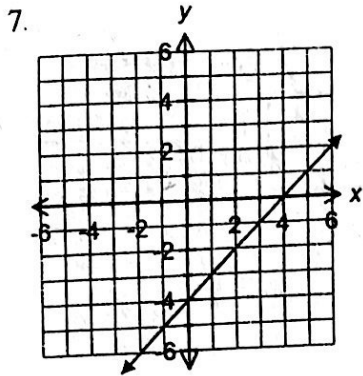
Range: $(-\infty, -3]$

6. Describe each of the following for the graph below.



- a) Domain in interval notation: $(-\infty, \infty)$
- b) Range in interval notation: $[-8, \infty)$
- c) Symmetry (even, odd, neither): neither
- d) x-intercept(s): $(-6, 0)$ $(2, 0)$
- e) y-intercept: $(0, -6)$
- f) Positive interval in interval notation: $(-\infty, -6) \cup (2, \infty)$
- g) Negative interval in interval notation: $(-6, 2)$
- h) Constant interval in interval notation: n/a
- i) Is there a maximum or minimum point? minimum
- j) What is the maximum or minimum point? $(-2, -8)$
- k) What is the maximum or minimum value? -8
- l) Increasing interval in interval notation: $(-2, \infty)$
- m) Decreasing interval in interval notation: $(-\infty, -2)$
- n) Left End Behavior: $\lim_{x \rightarrow -\infty} f(x) = \infty$
- o) Right End Behavior: $\lim_{x \rightarrow \infty} f(x) = \infty$

Find the intercepts of the given functions visually or algebraically. Write your answers as ordered pairs. You must show all your necessary work for full credit.



x-intercept: (4, 0)

y-intercept: (0, -4)

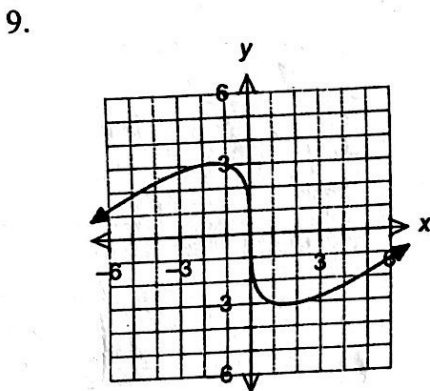
8. $-2x + 6y = -18$
X-int
 $-2x + 6(0) = -18$
 $-2x = -18$
 $x = 9$

Y-int
 $-2(0) + 6y = -18$
 $6y = -18$
 $y = -3$

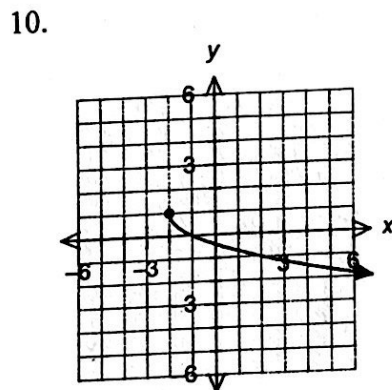
x-intercept: (9, 0)

y-intercept: (0, -3)

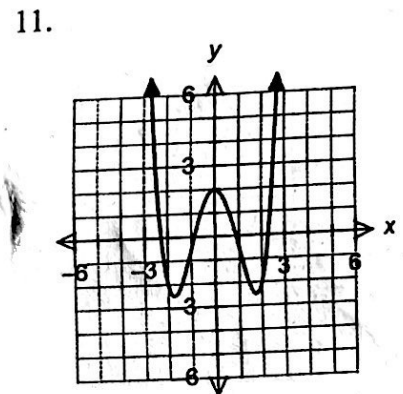
What type of symmetry does each of the following graphs have (odd, even, or neither)?



odd



neither



even

Simplify. Write answers with positive exponents only.

12. $(x^{\frac{1}{2}})^4$
 x^2

13. $5x^{-3}$
 $\frac{5}{x^3}$

14. $(3x)^{-2}$
 $3^{-2}x^{-2} = \frac{1}{9x^2}$

15. $(x^{\frac{3}{2}})(x^{-\frac{1}{4}})$
 $x^{-3/8} = \frac{1}{x^{3/8}}$

16. $\frac{x^{3/6}}{x^{1/3}}$
 $x^{5/6 - 1/3} = x^{2/3}$
 x

17. $(-4x^3)^2$
 $(-4)^2x^6 = 16x^6$

18. $(4x)^{-2}$
 $4^{-2}x^{-2} = \frac{1}{16x^2}$

19. $(-3x^4)^2$
 $(-3)^2x^8 = 9x^8$

20. $(x^{\frac{1}{2}})^6$
 x^3

Simplify each radical expression.

21. $\sqrt{256x^{14}}$

$16x^7$

22. $7\sqrt{45m^3n}$

$21m\sqrt{5mn}$

23. $\sqrt[3]{48w^{12}z^5}$

$2w^4z\sqrt[3]{6z^2}$

24. $3\sqrt{54mn^7}$

$9n^3\sqrt{6mn}$

25. $\sqrt[3]{250y^4z^7}$

$5yz^2\sqrt[3]{2yz}$

26. $\sqrt{48}$

$4\sqrt{3}$

27. $2\sqrt{90}$

$6\sqrt{10}$

Rewrite each expression in radical form, then simplify if possible.

28. $25^{\frac{3}{2}}$

$\sqrt[3]{25^3}$ or $(\sqrt{25})^3$
 $= 125$

29. $8(xy)^{\frac{1}{5}}$

$8\sqrt[5]{xy}$

Rewrite each expression using a rational exponent.

30. $\sqrt[7]{11x}$

$(11x)^{1/7}$

31. $14\sqrt[4]{x^{11}}$

$14x^{11/4}$

Rewrite using rational exponents, use the rules of exponents to simplify, then write your answer in radical form.

32. $\sqrt[3]{r^3} \cdot r^{3/9} = r^{1/3}$

$= \sqrt[3]{r}$

33. $\sqrt{t} \cdot \sqrt[3]{t^4}$

$t^{1/2} \cdot t^{4/3} = t^{31/21} = \sqrt[21]{t^{31}}$ or $t^{21}\sqrt{t^{10}}$

Add or subtract. Simplify by combining like radical terms, if possible.

34. $\sqrt{60} - 8\sqrt{15}$

$4\sqrt{15} - 8\sqrt{15} = -4\sqrt{15}$

35. $3\sqrt{8} + 4\sqrt{2} - 6\sqrt{5}$

$6\sqrt{2} + 4\sqrt{2} - 6\sqrt{5}$
 $10\sqrt{2} - 6\sqrt{5}$

36. $\sqrt{24} - \sqrt{6} + \sqrt{54}$

$2\sqrt{6} - \sqrt{6} + 3\sqrt{6}$
 $= 4\sqrt{6}$

Multiply and simplify.

37. $7\sqrt{2}(6 + \sqrt{10})$

$42\sqrt{2} + 7\sqrt{20}$
 $42\sqrt{2} + 14\sqrt{5}$

38. $(2 + \sqrt{10})(2 - \sqrt{10})$

$4 - 2\sqrt{10} + 2\sqrt{10} - \sqrt{100}$
 $4 - 10 = -6$

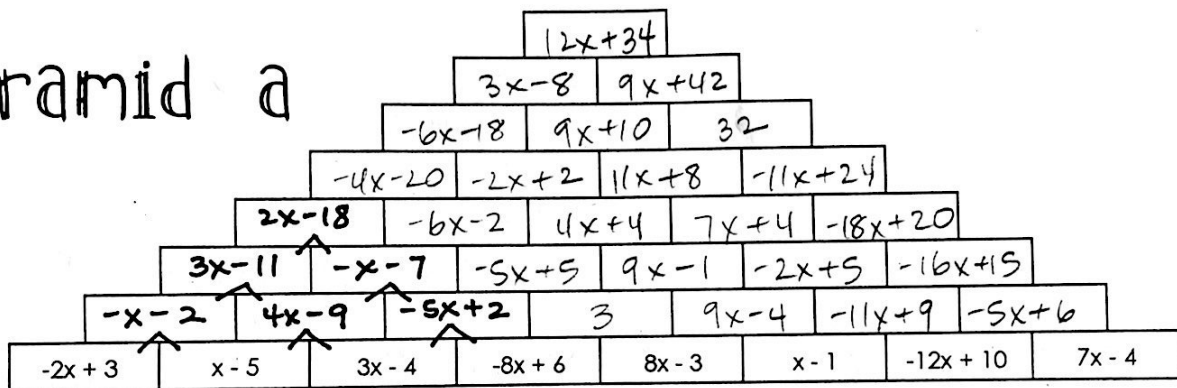
39. $(-3\sqrt{2})(5\sqrt{12})$

$-15\sqrt{24}$
 $-30\sqrt{6}$

combining like terms - pyramid style

Directions: Combine like terms in order to reach the top of the pyramid.

pyramid a



*combine like terms in the boxes next to each other and put the answer in the box above.

pyramid b

