Transformation of functions worksheet answers

I'm not robot!

I'm not robot!

PreCalculus Name_____
Ch. 4 Review (4.1-4.7) Period _____

* Show work on the separate sheet of paper.

[1-2] State the amplitude, period, frequency, phase shift, vertical shift, and midline of each function. Then graph two periods of the function. Be sure to label the scales on the axes of the graph.

1. $f(x) = 4\cos\frac{x}{2} - 5$ 2. $g(x) = -\sin\left(x + \frac{\pi}{2}\right)$

[3-6] State the period and vertical asymptotes. Then sketch the graph of each function.

3. $h(x) = \tan(x + \frac{\pi}{4})$ 4. $k(x) = \frac{1}{2}\sec(2x)$

5. $y = 2\csc\left(\frac{x}{3}\right)$ 6. $j(x) = -2\cot\left(2x + \frac{\pi}{3}\right)$

[7-12] Find the exact values, if they exist.

7. $\arccos(-\frac{1}{2})$ 8. $\tan^{-1}(-1)$ 9. $\sin^{-1}\pi$

10. $\tan^{-1}(\tan\frac{3\pi}{2})$ 11. $\tan(\arcsin\frac{-1}{2})$ 12. $\sin^{-1}(\cos\frac{\pi}{6})$

[13-16] Solve # ABC.

13. $A=30°$, $B=100°$, $a=15$
14. $A=38°$, $C=63°$, $b=15$
15. $a=7$, $b=10$, $c=5$
16. $C=40°$, $a=30$, $b=30$

[17-18] Find the area of # ABC.

17. $A=110°$, $b=21$, $c=18$
18. $a=25$, $b=23$, $c=14$

19. Find two triangles for which $A=49°$, $a=12$, $b=15$.

[20-22] Find the Exact Values of the five remaining trigonometric functions of θ.

20. $\tan\theta = 2$, where $\sin\theta > 0$ and $\cos\theta > 0$
21. $\cos\theta = -1/2$, where $\sin\theta > 0$
22. $\sec\theta = \sqrt{3}$, where $\sin\theta < 0$ and $\cos\theta > 0$

[23-26] angle of elevation / depression problems

23. A building is 50 feet high. At a distance away from the building, an observer notices that the angle of elevation to the top of the building is 41°. How far is the observer from the base of the building?

24. An airplane is flying at a height of 2 miles above the ground. The distance along the ground from the airplane to the airport is 5 miles. What is the angle of depression from the airplane to the airport?
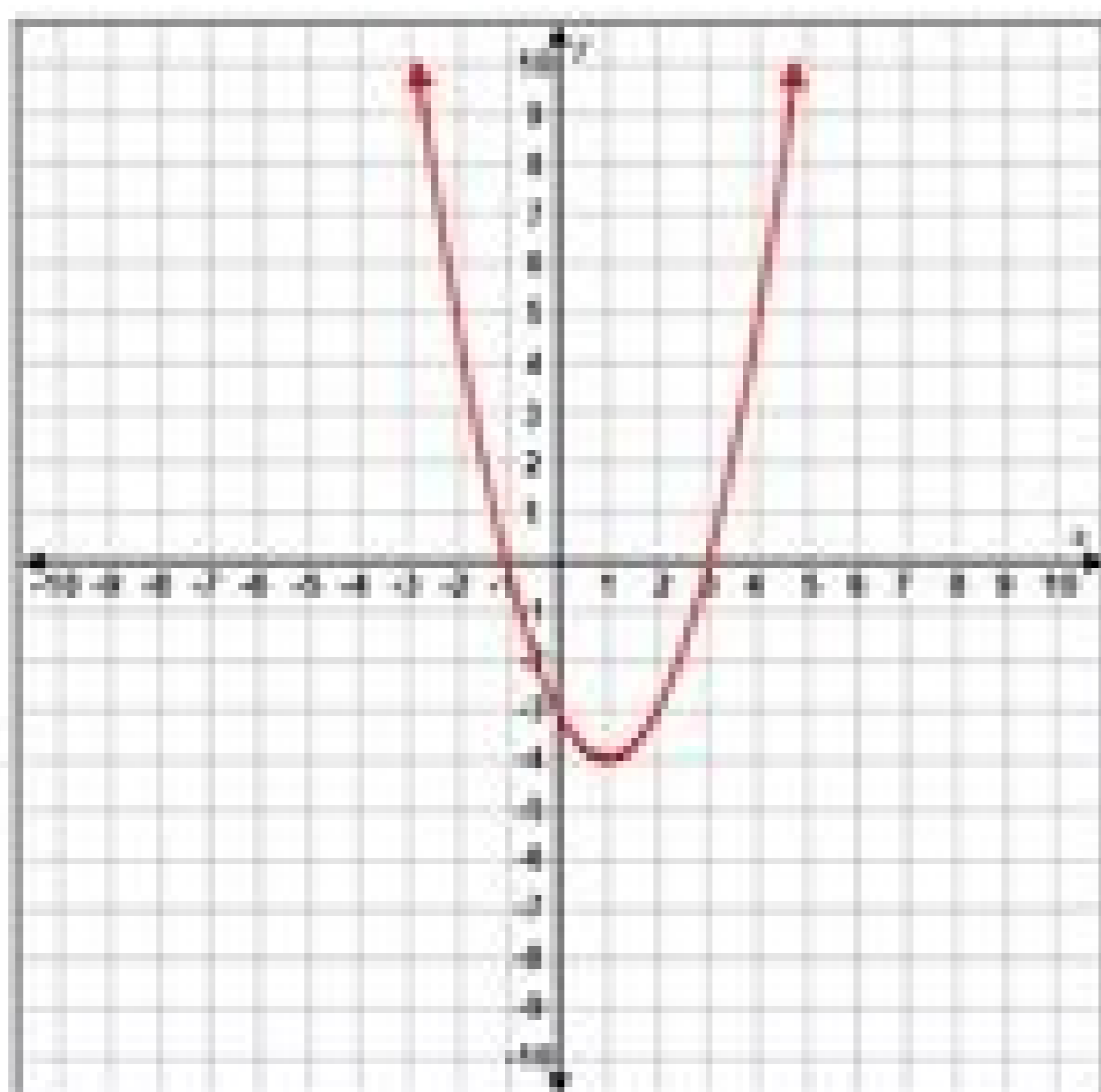
11. Graph $y = x^2 - 3x - 1$. Use your calculator to fill in the table, then plot your coordinates.

x	y
-3	17
-2	9
-1	0
0	-1
1	-4
2	-3
3	0
4	5

What is the equation of the axis of symmetry? $x = 1$

What is the vertex? $(1, -4)$

What are the roots? $x = -1$ and $x = 3$

12. Graph $y = -x^2 + 3x + 3$. Use your calculator to fill in the table, then plot your coordinates.

x	y
-3	-13
-2	-5
-1	0
0	3
1	4
2	3
3	0
4	-5

What is the equation of the axis of symmetry? $x = 1$

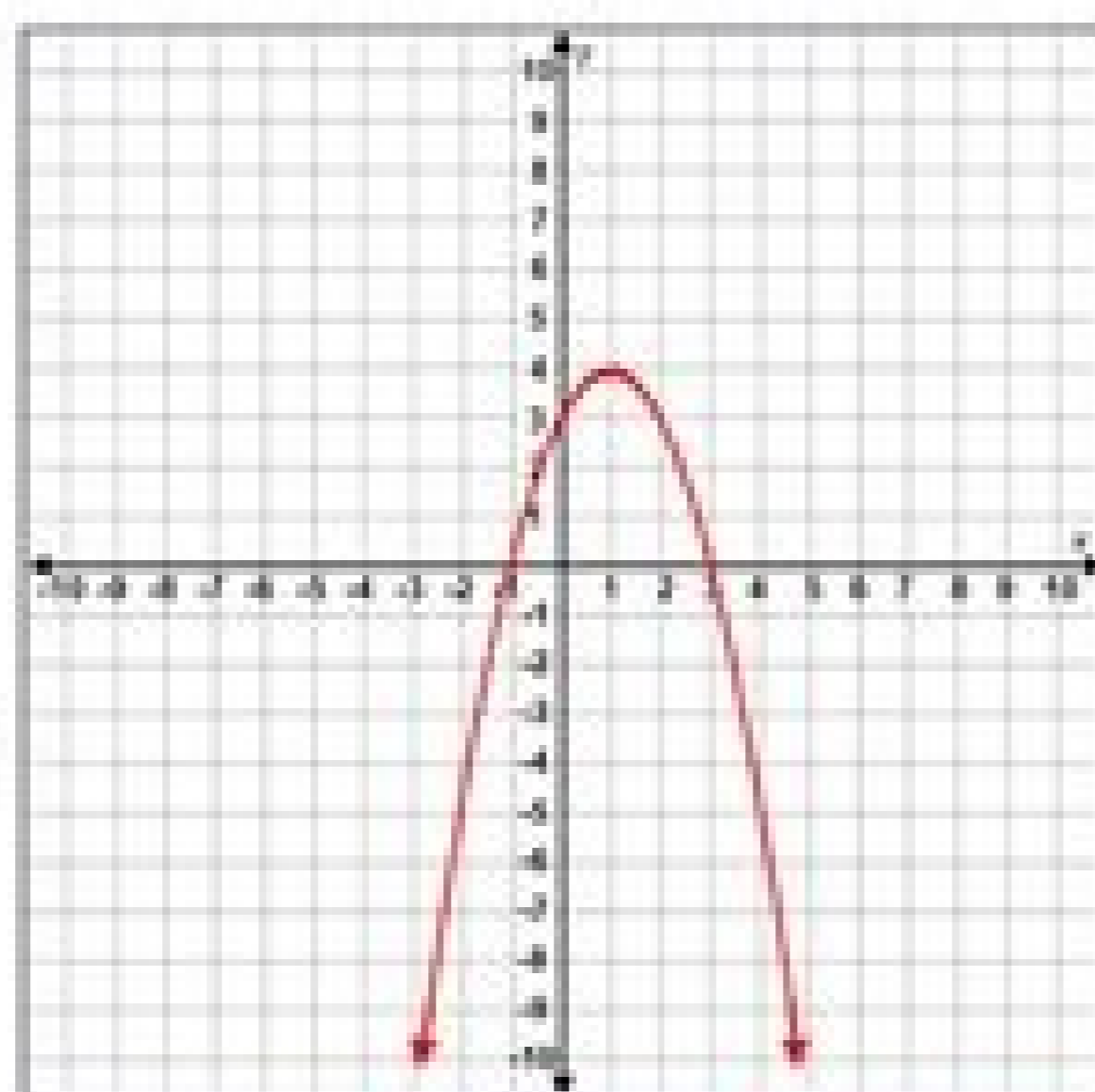What is the vertex? $(1, 4)$

What are the roots? $x = -1$ and $x = 3$

13. What similarities do the graphs in #11 and #12 have in common? They have the same roots and vertex.

| Parent Function	Graph	Parent Function	Graph
$y = x$ **Linear**, Odd Domain: $(-\infty, \infty)$ Range: $(-\infty, \infty)$ End Behavior: $x \to -\infty, \ y \to -\infty$ $x \to \infty, \ y \to \infty$		$y = |x|$ **Absolute Value**, Even Domain: $(-\infty, \infty)$ Range: $[0, \infty)$ End Behavior: $x \to -\infty, \ y \to \infty$ $x \to \infty, \ y \to \infty$	
$y = x^2$ **Quadratic**, Even Domain: $(-\infty, \infty)$ Range: $[0, \infty)$ End Behavior: $x \to -\infty, \ y \to \infty$ $x \to \infty, \ y \to \infty$		$y = \sqrt{x}$ **Radical**, Neither Domain: $[0, \infty)$ Range: $[0, \infty)$ End Behavior: $x \to \infty, \ y \to \infty$	
$y = x^3$ **Cubic**, Odd Domain: $(-\infty, \infty)$ Range: $(-\infty, \infty)$ End Behavior: $x \to -\infty, \ y \to -\infty$ $x \to \infty, \ y \to \infty$		$y = \sqrt[3]{x}$ **Cube Root**, Odd Domain: $(-\infty, \infty)$ Range: $(-\infty, \infty)$ End Behavior: $x \to -\infty, \ y \to -\infty$ $x \to \infty, \ y \to \infty$	
$y = b^x, \ b > 1$ **Exponential**, Neither Domain: $(0, \infty)$ Range: $(0, \infty)$ End Behavior: $x \to -\infty, \ y \to 0$ $x \to \infty, \ y \to \infty$		$y = \log_b(x), \ b > 1$ **Log**, Neither Domain: $(0, \infty)$ Range: $(-\infty, \infty)$ End Behavior: $x \to 0^+, \ y \to -\infty$ $x \to \infty, \ y \to \infty$	
$y = \dfrac{1}{x}$ **Rational (Inverse)**, Odd Domain: $(-\infty, 0) \cup (0, \infty)$ Range: $(-\infty, 0) \cup (0, \infty)$ End Behavior: $x \to -\infty, \ y \to 0$ $x \to \infty, \ y \to 0$		$y = \dfrac{1}{x^2}$ **Rational (Inverse Squared)**, Even Domain: $(-\infty, 0) \cup (0, \infty)$ Range: $(0, \infty)$ End Behavior: $x \to -\infty, \ y \to 0$ $x \to \infty, \ y \to 0$	
$y = \text{int}(x) = [\![x]\!]$ **Greatest Integer**, Neither Domain: $(-\infty, \infty)$ Range: $\{y : y \in \mathbb{Z}\}$ (integers) End Behavior: $x \to -\infty, \ y \to -\infty$ $x \to \infty, \ y \to \infty$		$y = C$ ($y = 2$ in the graph) **Constant**, Even Domain: $(-\infty, \infty)$ Range: $\{y : y = C\}$ End Behavior: $x \to -\infty, \ y \to C$ $x \to \infty, \ y \to C$	

Finding Quadratic Equations Quiz

I. Vertex Form — Express the following parabolas in vertex form

A. vertex: $(2, 5)$ through the point $(5, 14)$

B. vertex: $(-2, -5)$ through the point $(1, 22)$

C. vertex: $(3, 3)$ y-intercept: $(0, -15)$

D.

E.
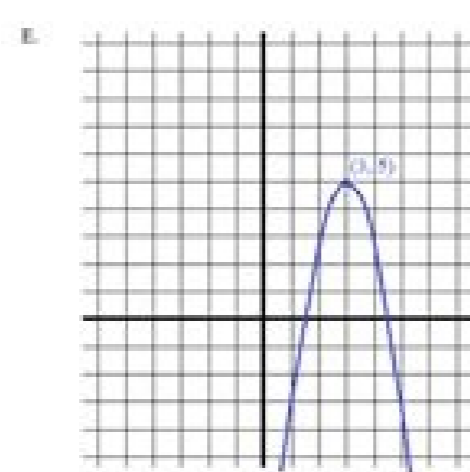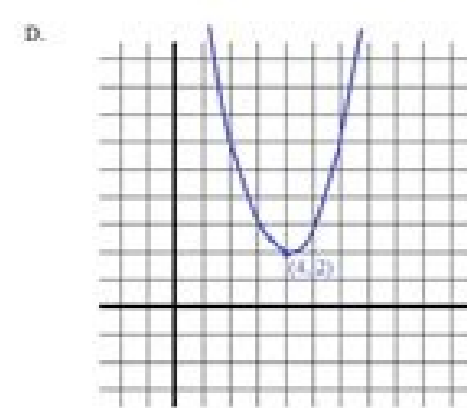
II. Intercept Form — Express the following quadratics in intercept form

A. x-intercepts: $(1, 0) \ (5, 0)$ vertex: $(3, 8)$

B. x-intercepts: $(-3, 0) \ (5, 0)$ another point on the curve: $(7, 4)$

C. vertex: $\left(\dfrac{-3}{2}, \dfrac{-25}{2}\right)$ y-intercept: $(0, -8)$

D.

E.
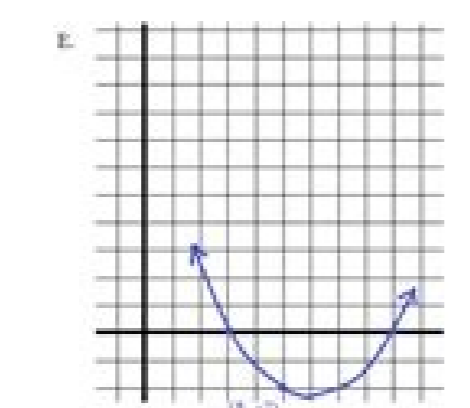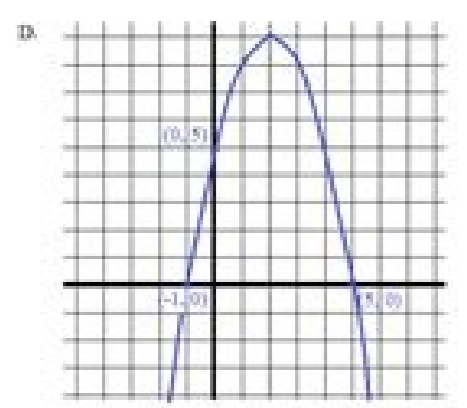
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