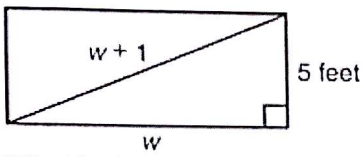
05/11/17, Math I Outcome 14 Review_Martin

Student:

Class:

Date:

1. **Mr. Hamilton is placing a support plank along the diagonal of a gate. The height of the gate is 5 feet, and the diagonal is 1 foot longer than the width of the gate, as shown below.**



What is the width, in feet, of the gate?

A. 3
B. 6
C. 12
D. 24

$w^2 + 5^2 = (w+1)^2 \rightarrow (w+1)(w+1)$

$w^2 + 25 = w^2 + 2w + 1$

$25 = 2w + 1$

$-1 \quad -1$

$\frac{24}{2} = \frac{2w}{2}$ $\quad w = 12$

2. **Which of the following equations best represents the data in the table?**

x	y
–2	8
–1	5
0	4
2	8
3	13

not linear!

→ shape w/ pts

A. $y = -2x + 4$
B. $y = -x^2 + 4$
C. $y = 2x + 4$
D. $y = x^2 + 4$

3. **The point (3, –1) is on a graph of $y = x^2 + kx - 4$. What is the value of *k*?**

A. –1
B. $-\frac{4}{3}$
C. –2
D. –6

$y = x^2 + kx - 4$

$-1 \quad 3 \quad 3$

$-1 = (3)^2 + k \cdot 3 - 4$

$-1 = 9 + 3k - 4$

$-1 = 5 + 3k$

$-5 \quad -5$

$\frac{-6}{3} = \frac{3k}{3}$

$k = -2$

4. What are the algebraic terms in the expression below?

$-4x^2y^3+xy-5$

A. x, y

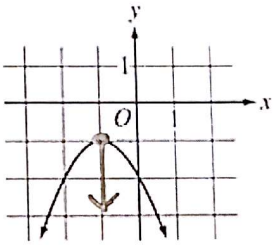
B. 2, 3, 1, and 1

C. -4, 1, and 5

D. $-4x^2y^3$, xy, and -5

5. **What is the range of the function in the graph below?**

y-values.



A. $y \le 0$

B. $y \le -1$

C. $y \le -2$

D. all real numbers

6. **Suppose $f(x) = x^2$ and $g(x) = 2x - 3$. What is the value of $g(4) + f(-3)$?**

$g(4) = 2(4) - 3$

$8 - 3$

5

$f(-3) = (-3)^2$

$+ \quad 9 = 14$

A. -4

B. 7

C. 14

D. 25

7. **Which statement describes the graph of $f(x) = x^2 - 2x - 3$?**

not linear!

check table to look for x-int (y-value = 0!)

A. a line with an x-intercept of $(-1, 0)$

B. a line with an x-intercept of $(-3, 0)$

C. a parabola with an x-intercept $(-1, 0)$

D. a parabola with an x-intercept of $(-3, 0)$

x-int

(3,0)

(-1,0)

8. Amil and Colton had two toy rockets they planned to launch from different buildings at different times. The height, h, of Amil's rocket launched from the top of a building after t seconds is modeled by the equation $h = -16t^2 + 100t + 40$, where 100 represents the initial velocity in feet per second. Colton launched his rocket from a building with a height that was double the height from where Amil's rocket was launched. The initial velocity of Colton's rocket was half the initial velocity of Amil's rocket. What is the approximate difference in the maximum heights of the two rockets after they were launched?

★ use calc + look @ graph ★

Colton

$-16t^2 + 50t + 80$

A. 1.6 feet
B. 40.0 feet
C. 50.0 feet
D. 77.2 feet

Amil max height

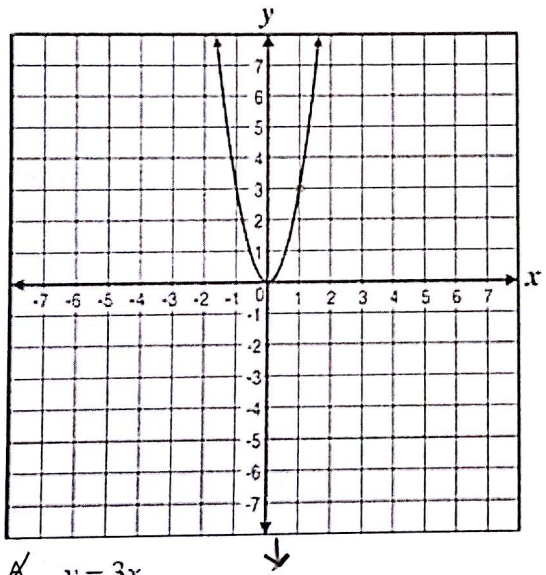
(3.125, 196.25)

Colton max height

(1.56, 119.06)

196.25 − 119.06 = 77.19

9. **Which of the following functions does the graph represent?**



A. $y = 3x$
B. $y = 3x^2$ → parabola
C. $y = 3x^3$
D. $y = 3|x|$

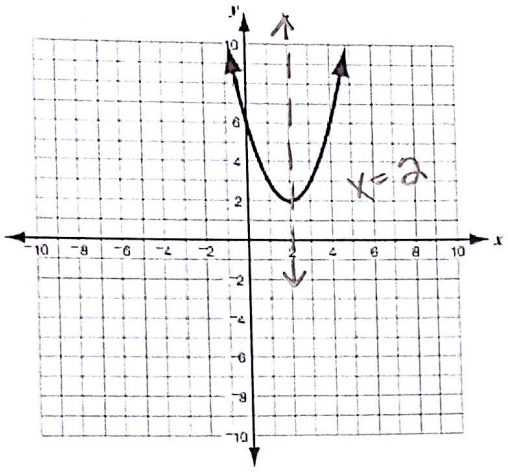
10. **What is the number of *x*-intercepts of the graph of the quadratic function** $f(x) = 9x^2 + 30x + 25$?

A. 0
B. 1
C. 2
D. 3

touches x-axis only once ←

Put into calc & look @ graph or table

11. The graph below shows a function $f(x)$.



Another function $g(x)$ is defined as $g(x)=x^2-6x+10$. → vertex. (3,1) → x=3

Which function has an axis of symmetry at a greater distance from the y-axis?

g(x) is bigger!

12. Joseph compared the function $f(x) = 3x^2 + 2x - 1$ → y-int. to the quadratic function that fits the values shown in the table below.

x	g(x)
0	−1
1	8
2	23
3	44
4	71

y-int
-1

Which statement is true about the two functions?

A. The functions have the same y-intercepts.

B. The functions have the same x-intercepts.

C. The functions have the same vertex.

D. The functions have the same axis of symmetry.

13. A company produces swimming pools. Its daily cost can be modeled with the function $P(x)=20x^2 - 240x$, where x is the number of swimming pools produced. If the company makes at least 1 pool a day, how many pools need to be produced for the company to break even?

$20x^2-240x = 0$

$20x(x-12)$

X=12

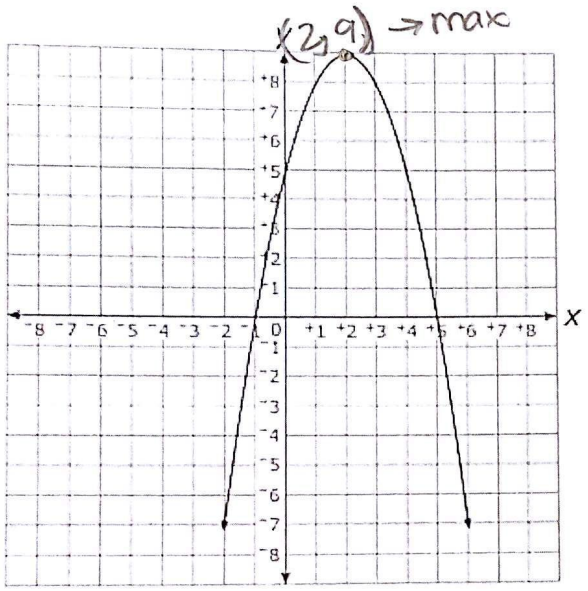
↓ Check table to see when profit or y-value = 0!

14. If $f(x) = x^2 - x$, what is $f(-5)$?

$(-5)^2 - (-5)$

$25 + 5 = \boxed{30}$

15. Megan compared the maximum value of $f(x) = -4x^2 + 2x + 1$ to the maximum value of the function graphed below.



Put in calc & look @ graph.

f(x) vertex = .25, 1.25.

What is the value of the smaller maximum?

$\boxed{1.25}$

16. A quadratic function crosses the x-axis at $\left(\frac{2}{3}, 0\right)$ and (6, 0). Which of the following is the factored form of this function's related quadratic expression?

(A.) $(3x - 2)(x - 6)$
B. $(3x + 2)(x + 6)$
~~C.~~ $(2x - 3)(x - 6)$
~~D.~~ $(2x + 3)(x + 6)$

$3 \cdot x = \frac{2}{3} \cdot 3$ → get rid of fraction!

$3x = 2$

$-2 \quad -2$

$\boxed{3x - 2 = 0}$

$x = 6$

$-6 \quad -6$

$\boxed{x - 6 = 0}$

* or put on calculator & look @ table or graph

17. The zeros of a quadratic function are 1 and 7. To which factored quadratic expression is this function related?

A. $(x - 1)(x + 7)$
B. $(x + 1)(x - 7)$
C. $(x + 1)(x + 7)$
(D.) $(x - 1)(x - 7)$

$x = 1$

$-1 \quad -1$

$\boxed{x - 1 = 0}$

$x = 7$

$-7 \quad -7$

$\boxed{x - 7 = 0}$

18. The quadratic expression $x^2 - 2x - 35$ can be factored into $(x + 5)(x - 7)$. Which ordered pairs represent the zeros of this expression's related quadratic function?

A. (5, 0) and (–7, 0)
(B.) (–5, 0) and (7, 0)
C. (0, –5) and (0, 7)
D. (0, 5) and (0, –7)

$x + 5 = 0$

$-5 \quad -5$

$\boxed{x = -5}$

$x - 7 = 0$

$+7 \quad +7$

$\boxed{x = 7}$

19. **Which binomial is factored correctly?**

A. $2x^2 - 81 = (x - 9)(x + 9)$
B. $9x^2 - 14 = (3x - 7)(3x + 7)$
C. $10x^2 - 9 = (5x - 3)(5x + 3)$
D. $36x^2 - 1 = (6x - 1)(6x + 1)$

Check with area model using dimensions aka factors!

20. **What is the complete factorization of the binomial shown below?**

$2x^2 - 18$

A. $2(x - 3)^2$
B. $(2x - 9)^2$
C. $2(x - 3)(x + 3)$
D. $(2x - 9)(x + 2)$

$2(x^2 - 9)$

	x	−3
x	x^2	$-3x$
+3	$+3x$	-9

II + III = 0
I · IV = −9

1	9
+3	−3

21. **Which expression is equivalent to $2x^2 - 10x - 48$ in factored form?**

A. $2(x + 2)(x - 12)$
B. $2(x + 3)(x - 8)$
C. $2(x + 4)(x - 6)$
D. $2(x - 3)(x + 8)$

$2(x^2 - 5x - 24)$

$2(x - 8)(x + 3)$

	x	−8
x	x^2	$-8x$
+3	$+3x$	-24

II + III = −5
I · IV = −24

1	24
2	12
+3	−8
4	6

22. **The area of a rectangle is represented by $(x^2 - 14x - 32)$ square units. If the height of the rectangle is represented by $(x + 2)$ units, which expression best represents the base of the rectangle?**

A. $(x - 34)$ units
B. $(x - 7)$ units
C. $(x + 16)$ units
D. $(x - 16)$ units

	x	+2
x	x^2	
−16		-32

23. **The area of a triangle is represented by the expression $\left(x^2 + \frac{9}{2}x + 2\right)$ square units. If the length of the base is represented by the expression $(x + 4)$ units, which expression best represents the height of the triangle?**

A. $\left(x + \frac{1}{2}\right)$ units
B. $(x - 2)$ units
C. $(2x + 1)$ units
D. $\left(2x + \frac{1}{2}\right)$ units

	x	+4
2x	$2x^2$	
+1		$+4$

get rid of fraction!

$2\left(x^2 + \frac{9}{2}x + 2\right)$

$2x^2 + 9x + 4$

24. What is $2x^3 - 13x^2 + 6x$ in factored form?

(A) $x(2x - 1)(x - 6)$
B. $x(2x + 1)(x + 6)$
C. $x(2x - 3)(x - 2)$
D. $x(2x + 3)(x + 2)$

$x(2x^2 - 13x + 6)$

	$2x$	-1
x	$2x^2$	$-1x$
-6	$-12x$	$+6$

II + III = −13

I · IV = 12

−1	−12
2	6
3	4

$x(x-6)(2x-1)$

25. What is $2t^3 + 8t^2 - 24t$ in factored form?

(A) $2t(t - 2)(t + 6)$
B. $2t(t + 2)(t - 6)$
C. $2t(t - 3)(t + 4)$
D. $2t(t + 3)(t - 4)$

$2t(t^2 + 4t - 12)$

	t	-2
t	t^2	$-2t$
$+6$	$+6t$	-12

II + III = +4

I · IV = −12

1	12
−2	+6
3	4

$2t(t-2)(t+6)$