Benchmark Test

10 min

Correct Wednesday and Thursday worksheet

Wednesday Name: Key Hr:

Factoring Trinomials Worksheet

Factor the trinomial whose leading coefficient is "1"

1. $t^2+8t+12$ $(t+2)(t+6)$

2. $m^2-7m+12$ $(m-3)(m-4)$

3. $n^2-3n-18$ $(n+3)(n-6)$

Factor the trinomial whose leading coefficient is NOT "1"

4. $3h^2+2h-16$ -48, -6, 8, 2
$3h^2-6h+8h-16$
$3h(h-2)+8(h-2)$
$(h-2)(3h+8)$

5. $6c^2+7c+2$
$6c^2+3c+4c+2$
$3c(2c+1)+2(2c+1)$
$(2c+1)(3c+2)$

6. $5p^2-22p+8$ 40, -20, -2, -22
$5p^2-20p-2p+8$
$5p(p-4)-2(p-4)$
$(p-4)(5p-2)$

Factor the perfect square trinomial

7. r^2+4r+4 $(r+2)^2$

8. $49z^2-56z+16$ $(7z-4)^2$

9. $e^2-2cde+c^2d^2$ $(e-cd)^2$

Factor Completely

10. $n^2+3n-18$ $(n+6)(n-3)$

11. $v^2-18v+80$ $(v-8)(v-10)$

12. $18z^2+9z+1$ 18, 6, 9, 3
$18z^2+6z+3z+1$
$6z(3z+1)+1(3z+1)$
$(3z+1)(6z+1)$

13. $6x^2+x-15$ -90, -9, 10, 1
$6x^2-9x+10x-15$
$3x(2x-3)+5(2x-3)$
$(2x-3)(3x+5)$

14. $m^2-12m+36$ $(m-6)(m-6)$

15. $25v^2+30v+9$ $(5v+3)^2$

16. $6c^2-10c-4$ 24, -12, $+2$, -10
$6c^2-12c+2c-4$
$6c(c-2)+2(c-2)$
$(c-2)(6c+2)$

17. $x^2+7x-44$ $(x+11)(x-4)$

18. $w^2+24w+144$ $(w+12)(w+12)$
$=(w+12)^2$

19. p^2-p-56 $(p-8)(p+7)$

20. $8m^2-10m+3$ 24, -6, -4, -10
$8m^2-6m-4m+3$
$2m(4m-3)-1(4m-3)$
$(4m-3)(2m-1)$

21. $u^2-16u-36$ $(u+2)(u-18)$

22. $15y^2-y-2$ -30, -6, $+5$, -1
$15y^2-6y+5y-2$
$3y(5y-2)+1(5y-2)$
$(5y-2)(3y+1)$

23. $16m^2-24mn+9n^2$ $(4m-3n)^2$

24. $6z^2-5z-4$ 24, -8, $+3$, -5
$6z^2-8z+3z-4$
$2z(3z-4)+1(3z-4)$
$(3z-4)(2z+1)$

Thursday

Factoring Review

Name: Key Hr:____

Factor Completely.

Factor the difference of squares

1. $m^2 - 36$

$(m-6)(m+6)$

2. $25b^2 - 4$

$(5b-2)(5b+2)$

Factor out the greatest common factor

3. $18x^2 - 36xy$

$18x(x-2y)$

4. $48r^2 - 4r$

$4r(12r-1)$

Factor by grouping

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

$x^2(3x-1) - 4(3x-1)$

$(3x-1)(x^2-4)$ $(3x-1)(x+2)(x-2)$

6. $(6x^2 + 2x) + (6xy + 2y)$

$2x(3x+1) + 2y(3x+1)$

$(3x+1)(2x+2y)$

$2(x+y)(3x+1)$

Factor the trinomials

7. $6x^2 + x - 15$

$(2x-3)(3x+5)$

(other side)

8. $x^2 - 9x - 36$

$(x-12)(x+3)$

(change s.t. to −)

36, -12, 3, -9

Factor completely

9. $a^2 - 121$

$(a+11)(a-11)$

10. $x^2 - 5x - 6$

$(x-6)(x+1)$

11. $(6x^3 - 10x^2) + (3x - 5)$

$2x^2(3x-5) + 1(3x-5$

$(3x-5)(2x^2+1)$

12. $2x^2 - 18$

$2(x^2-9)$

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

13. $7x^2 - 112x$

$7x(x-16)$

14. $2x^2 - 5x - 12$

$2x^2 - 8x + 3x - 12$

-24, -8, $+3$, 5

$2x(x-4) + 3(x-4)$

$(x-4)(2x+3)$

15. $(4x^3 + 12x^2) - x - 3$

$4x^2(x+3) - 1(x+3)$

$(x+3)(4x^2-1)$

$(x+3)(2x+1)(2x-1)$

16. $x^3 + 5x^2 + 6x$

$x(x^2 + 5x + 6)$

$x(x+2)(x+3)$

Solve the quadratic equations below

17. $4x^2 - 9$

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

18. $18x^2 + 9x + 1$

$(18x^2 + 6x) + (3x + 1)$

18, 6, 3, 9

$6x(3x+1) + 1(3x+1)$

$(3x+1)(6x+1)$

19. $3x^2 - 12x$

$3x(x-4)$

20. $x^2 - 12x + 36$

$(x-6)^2$

Go over Free Response Practice Test

Math 2C Practice Final: Free Response

Name: _____

Hour: _____

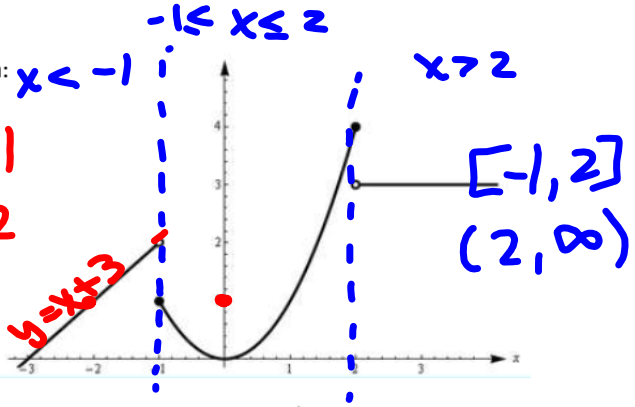
Read all instructions completely. Show all of your work. No points will be given without appropriate work being shown and answers indicated.

1. Write the piecewise function for the given graph:

$y = |x+3|$

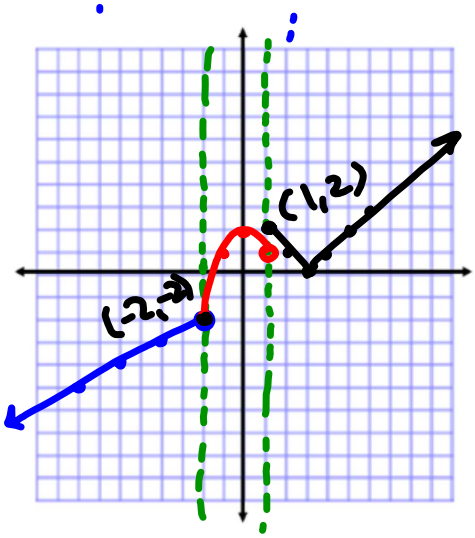
$$f(x) = \begin{cases} x+3, & x < -1 \\ x^2, & -1 \le x \le 2 \\ 3, & x > 2 \end{cases}$$

$y =$



2. Graph the given piecewise function:

$$f(x) = \begin{cases} \frac{1}{2}x - 1, & x < -2 \\ -x^2 + 2, & -2 \le x < 1 \\ |x - 3|, & x \ge 1 \end{cases}$$



$-(-2)^2+2$

3. $f(-2) =$ -2 (1 point)

4. $f(1) =$ 2 (1 point)

5. Given the function: $f(x) = 3x^2 - 2$,

Find the average rate of change over the interval **[0, 5]**

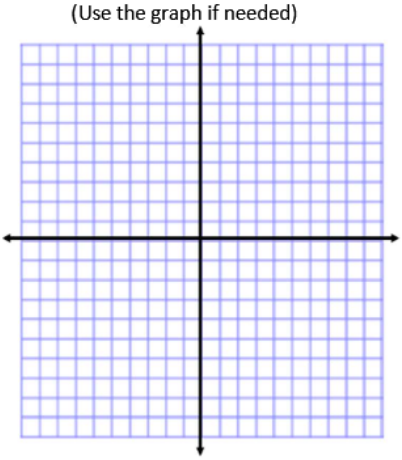
[a,b] $\frac{f(b)-f(a)}{b-a}$ Avg Rate of Change

$\frac{f(5)-f(0)}{5-0} = \frac{3(5)^2-2-3(0)^2-2}{5} = \frac{73+2}{5} = \frac{75}{5}$

Average Rate of Change: 15

Solve the following system of equations, show all your work.

(Use the graph if needed)



6. $y = -x^2 - 5$

$y = x^2 + 10x + 3$

$-(-1)^2 - 5$ (x, y)

$-(-4)^2 - 5$

$(-1, -6)$

$(-4, -21)$

$-x^2 - 5 = x^2 + 10x + 3$

$+x^2 + 5 \quad +x^2 \quad +5$

$0 = 2x^2 + 10x + 8$

$\frac{0}{2} = \frac{2x^2}{2} + \frac{10x}{2} + \frac{8}{2}$

$0 = x^2 + 5x + 4$

$0 = (x+1)(x+4)$

$x+1=0 \quad x+4=0$

$-1 \quad -1 \quad -4 \quad -4$

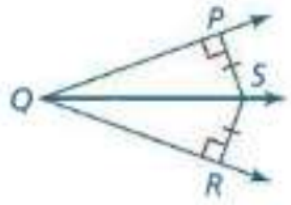
$x=-1 \quad x=-4$

7. Organize and list the following statements and reason complete the following proof:

Statements	Reasons
QS bisects $\angle PQR$	Given
$QS \cong QS$	All right angles are congruent
$\Delta SQP \cong \Delta SQR$	HL
$SP \perp QP, SR \perp QR, SP = SR$	CPCTC
$\angle P \cong \angle R$	Reflexive
$\angle PQS \cong \angle RQS$	Definition of a perpendicular
$< P \text{ and } < R \text{ are Right Angles}$	Definition of Angle Bisector

Given: $SP \perp QP, SR \perp QR, SP = SR$

Prove: $QS \text{ bisects } \angle PQR$



Statement	Reason

Ax^2+Bx+C

8. Given the rectangle below, write an expression **in standard form** that could represent the area of the rectangle.

$A=(-2x+13)(4x-5)$

$-8x^2+10x+52x-65$

$-8x^2+62x-65$

9. A theme park has two rides side by side, The Joy Ride and Old Clunker. The Joy Ride is a calmer ride and Old Clunker is a fast roller coaster. The height, in feet, off the ground of the people on each ride can be modeled by the following equations, where t is time in seconds. The Joy Ride by the function $s(t) = -7.5t + 250$. Old Clunker by the function $f(t) = -4t^2 + 80t + 10$. How many times will the two rides be at the same height? At what time(s) will the two rides be at the same height? (Round to the nearest hundredth if needed) [Hint: draw a picture]

output

input

$-7.5t+250=-4t^2+80t+10$

$+7.5t \quad -250 \quad +7.5t-250$

$0=-4t^2+87.5t-240$

$a=-4$

$b=87.5$

$c=-240$

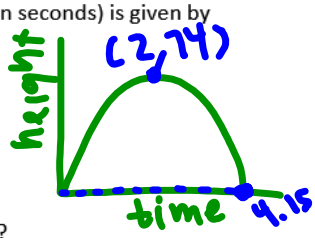
$$\frac{-87.5\pm\sqrt{(87.5)^2-4(-4)(-240)}}{2(-4)}=3.2,\ 18.7 \text{ seconds}$$

Use the following information to answer questions 10-15.

If a football is kicked straight upward, then the height $h(t)$ of the football (in feet) at time t (in seconds) is given by

(time, height)

$$h(t) = -16t^2 + 64t + 10.$$



10. What is the height of the football 4 seconds after it is kicked?

$h(4)=-16(4)^2+64(4)+10=10$ ft

11. How long does it take for the football to return to earth (round to the nearest hundredth)?

$$\frac{-64\pm\sqrt{(64)^2-4(-16)(10)}}{2(-16)}=4.15 \text{ seconds}$$

12. How long does it take to reach the maximum height?

$\frac{-b}{2a} \quad \frac{-64}{2(-16)}=2$ seconds

13. What is the maximum height?

$h(2)=-16(2)^2+64(2)+10=74$ ft

14. What is the real world domain of the function?

$[0, 4.15]$

15. What is the real world range of the function?

$[0, 74]$

Use the chart to answer questions 16-19. Write answers as reduced fractions.

(H = Drinks Hot Chocolate, C = Drinks Cider, H' = Doesn't Drink Hot Chocolate, C' = Doesn't Drink Cider)

	Drinks Hot Chocolate	Doesn't Drink Hot Chocolate	Total
Drinks Cider	246	51	297
Doesn't Drink Cider	88	15	103
Total	334	66	400

16. What is the probability of choosing someone that drinks hot chocolate? **P(H)**

$\frac{334}{400} = 83.5\%$

17. What is the probability of choosing someone that doesn't drink either? **P(H' ∩ C')**

$\frac{15}{400} = 3.75\%$

18. What is the probability of choosing someone that drinks cider given they drink hot chocolate? **P(C|H)**

$\frac{246}{334} = 73.7\%$

19. What is the probability of choosing someone that drinks hot chocolate or cider? **P(H ∪ C)**

$\frac{334}{400} + \frac{297}{400} - \frac{246}{400} = \frac{385}{400} = 96\%$