3pts for Context

15 points Possible

7. $x^2 - 3x - 10 < 0$

$f(x) = x^2 - 3x - 10$

$x^2 - 3x - 10 = 0$

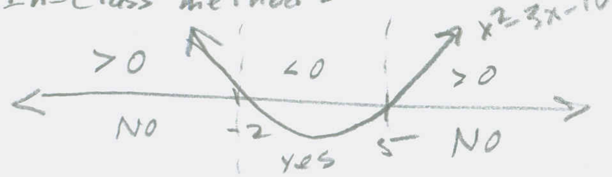
$(x-5)(x+2) = 0$

$x = 5,\ x = -2$ are the zeros of f.

Interval	$(-\infty, -2)$	$(-2, 5)$	$(5, \infty)$
Test Number	-3	0	6
Value of f	8	-10	8
Conclusion	Positive	Negative	Positive

The solution set is $\{x \mid -2 < x < 5\}$ or, using interval notation, $(-2,\ 5)$.

In-Class method:



10. $x^2 + 8x > 0$

$f(x) = x^2 + 8x$

$x^2 + 8x = 0$

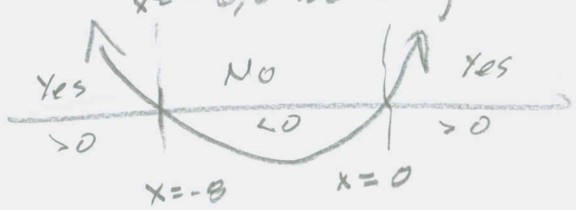
$x(x+8) = 0$

$x = -8,\ x = 0$ are the zeros of f.

Interval	$(-\infty, -8)$	$(-8, 0)$	$(0, \infty)$
Test Number	-9	-1	1
Value of f	9	-7	9
Conclusion	Positive	Negative	Positive

The solution set is $\{x \mid x < -8 \text{ or } x > 0\}$ or, using interval notation, $(-\infty, -8) \cup (0,\ \infty)$. → 2pts

In-Class Method:
$x = -8, 0$ are key:



WANT ">0"

13. $x^2 + x > 12$

$x^2 + x - 12 > 0$ → 1pt

$f(x) = x^2 + x - 12$

$x^2 + x - 12 = 0$

$(x+4)(x-3) = 0$

$x = -4,\ x = 3$ are the zeros of f

Interval	$(-\infty, -4)$	$(-4, 3)$	$(3, \infty)$
Test Number	-5	0	4
Value of f	8	-12	8
Conclusion	Positive	Negative	Positive

The solution set is $\{x \mid x < -4 \text{ or } x > 3\}$ or, using interval notation, $(-\infty, -4) \cup (3,\ \infty)$.

→ 2pts

18. $x(x+1) > 20$

$x^2 + x > 20$

$x^2 + x - 20 > 0$

$f(x) = x^2 + x - 20$

$x^2 + x - 20 = 0$

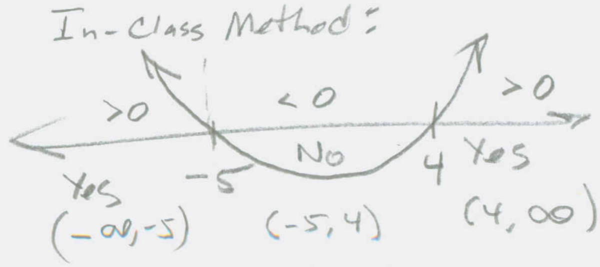
$(x+5)(x-4) = 0$

$x = -5,\ x = 4$ are the zeros of f.

Interval	$(-\infty, -5)$	$(-5, 4)$	$(4, \infty)$
Test Number	-6	0	5
Value of f	10	-20	10
Conclusion	Positive	Negative	Positive

The solution set is $\{x \mid x < -5 \text{ or } x > 4\}$ or, using interval notation, $(-\infty, -5) \cup (4,\ \infty)$.

In-Class Method:



5

23. The domain of the expression $f(x) = \sqrt{x^2 - 16}$ includes all values for which $x^2 - 16 \geq 0$.

2pts

$p(x) = x^2 - 16$

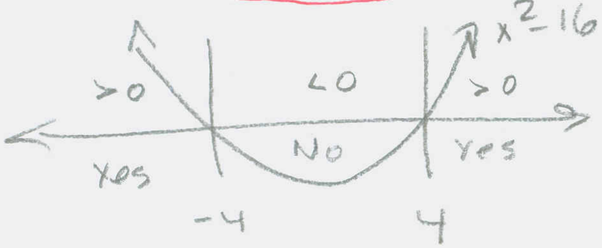
$(x+4)(x-4) = 0$

$x = -4,\ x = 4$ are the zeros are of p.

Interval	$(-\infty, -4)$	$(-4, 4)$	$(4, \infty)$
Test Number	-5	0	5
Value of p	9	-16	9
Conclusion	Positive	Negative	Positive

1pt

The domain of f is $\{x \mid x \leq -4 \text{ or } x \geq 4\}$ or, using interval notation, $(-\infty, -4] \cup [4, \infty)$.



Can include $x = \pm 4$.

34. a. The ball strikes the ground when $s(t) = 96t - 16t^2 = 0$.

1pt

$96t - 16t^2 = 0$

$16t(6 - t) = 0$

$t = 0, t = 6$

1pt

The ball strikes the ground after 6 seconds.

b. Find the values of t for which

$$96t - 16t^2 > 128$$

$-16t^2 + 96t - 128 > 0$

$16t^2 - 96t + 128 < 0$

2nd is easier to analyze & it means the same thing

$16(t^2 - 6t + 8) < 0$

$16(t-4)(t-2) < 0$

The zeros are $t = 2$ and $t = 4$.

$s(t) = -16t^2 + 96t - 128$

Interval	$(-\infty, 2)$	$(2, 4)$	$(4, \infty)$
Test Number	1	3	5
$s(t)$	-32	32	-32
Conclusion	Negative	Positive	Negative

1pt

The solution set is $\{t \mid 2 < t < 4\}$ or, using interval notation, $(2, 4)$. The ball is more than 128 feet above the ground for times between 2 and 4 seconds.

1pt