m04100046 stupid

MATH 0320 Final Exam Review

(1) Factor $81x^2 - 49 =$

$(9x)^2 - (7)^2 =$

$(9x+7)(9x-7) =$

Formula $a^2 - b^2 = (a+b)(a-b)$

(2.) Solve

$(2x+1)(5x-3) = 0$

Let $2x+1=0$ OR $5x-3=0$

$2x+1-1 = 0-1$ OR $5x-3+3 = 0+3$

$2x = -1$ OR $5x = 3$

$\frac{2x}{2} = \frac{-1}{2}$ OR $\frac{5x}{5} = \frac{3}{5}$

$x = -\frac{1}{2}$ OR $x = \frac{3}{5}$

(3.) Solve

$x^2 + 2x - 80 = 0$

$(x-8)(x+10) = 0$

Let $x-8=0$ OR $x+10=0$

$x-8+8 = 0+8$ OR $x+10-10 = 0-10$

$x = 8$ OR $x = -10$

80.1
40.2
20.4
10.8
Possible

(4.) Solve

$x^2 - 7x - 18 = 0$

$(x+2)(x-9) = 0$

Let $x+2=0$ OR $x-9=0$

$x+2-2 = 0-2$ OR $x-9+9 = 0+9$

$x = -2$ OR $x = 9$

18.1
9.2
6.3
Possible

5. Solve

$x^2 - x = 72$

$x^2 - x - 72 = 72 - 72$

$x^2 - x - 72 = 0$

$(x + 8)(x - 9) = 0$

Let $x + 8 = 0$ OR $x - 9 = 0$

$x + 8 - 8 = 0 - 8$ OR $x - 9 + 9 = 0 + 9$

$x = -8$ OR $x = 9$

72.1
36.2
18.4
9.8
Possible

6. Solve

$x^2 + 3x = 28$

$x^2 + 3x - 28 = 28 - 28$

$x^2 + 3x - 28 = 0$

$(x - 4)(x + 7) = 0$

Let $x - 4 = 0$ or $x + 7 = 0$

$x - 4 + 4 = 0 + 4$ OR $x + 7 - 7 = 0 - 7$

$x = 4$ or $x = -7$

28.1
14.2
4.7

7. Solve

$2x^2 - 7x - 9 = 0$

$(2x - 9)(x + 1) = 0$

Let $2x - 9 = 0$ OR $x + 1 = 0$

$2x - 9 + 9 = 0 + 9$ OR $x + 1 - 1 = 0 - 1$

$2x = 9$ or $x = -1$

$\frac{2x}{2} = \frac{9}{2}$

$x = \frac{9}{2}$

2.1
9.1
3.3

(2)

8. Solve

$15x^2 - 8x = 0$

$x(15x - 8) = 0$

$x = 0$ OR $15x - 8 = 0$

$15x - 8 + 8 = 0 + 8$

$15x = 8$

OR $\frac{15x}{15} = \frac{8}{15}$

$x = \frac{8}{15}$

9. Solve

formula: $a^2 - b^2 = (a+b)(a-b)$

$9x^2 - 16 = 0$

$(3x)^2 - (4)^2 = 0$

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

$3x + 4 = 0$ OR $3x - 4 = 0$

$3x + 4 - 4 = 0 - 4$ OR $3x - 4 + 4 = 0 + 4$

$3x = -4$ OR $3x = 4$

$\frac{3x}{3} = \frac{-4}{3}$ OR $\frac{3x}{3} = \frac{4}{3}$

$x = -\frac{4}{3}$ OR $x = \frac{4}{3}$

10. Solve

$3x^2 + 21x + 36 = 0$

$3(x^2 + 7x + 12) = 0$

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

$3 = 0$ OR $x + 3 = 0$ OR $x + 4 = 0$

$x + 3 - 3 = 0 - 3$ OR $x + 4 - 4 = 0 - 4$

$x = -3$ OR $x = -4$

possible: 12·1, 6·2, 3·4

11. Solve

$15x^2+31x+1=-9$

$15x^2+31x+1+9=-9+9$

$15x^2+31x+10=0$

$(3x+5)(5x+2)=0$

15.1
3.5

10.1
2.5
Possible

4

Let $3x+5=0$ OR $5x+2=0$

$3x+5-5=0-5$ OR $5x+2-2=0-2$

$3x=-5$ OR $5x=-2$

$\frac{3x}{3}=\frac{-5}{3}$ OR $\frac{5x}{5}=\frac{-2}{5}$

$x=-5/3$ OR $x=-2/5$

12. Solve

$10x^3+70x^2+120x=0$

$10x(x^2+7x+12)=0$

$10x(x+3)(x+4)=0$

12.1
6.2
3.4

Let $10x=0$ OR $x+3=0$ OR $x+4=0$

$\frac{10x}{10}=\frac{0}{10}$ OR $x+3-3=0-3$ OR $x+4-4=0-4$

$x=0$ OR $x=-3$ OR $x=-4$

13. Solve

$y^3+6y^2+9y=0$

$y(y^2+6y+9)=0$

$y(y+3)(y+3)=0$

9.1, 3.3 Possible

$y=0$ OR $y+3=0$ OR $y+3=0$

$y+3-3=0-3$ OR $y+3-3=0-3$

$y=-3$ $y=-3$

14. Solve

$(3x+2)(9x^2+12x+4)=0$

$(3x+2)(3x+2)(3x+2)=0$

Let $3x+2=0$ or $3x+2=0$ or $3x+2=0$

$3x+2-2=0-2$ or $3x+2-2=0-2$ or $3x+2-2=0-2$

$3x=-2$ or $3x=-2$ or $3x=-2$

$\frac{3x}{3}=\frac{-2}{3}$ or $\frac{3x}{3}=\frac{-2}{3}$ or $\frac{3x}{3}=\frac{-2}{3}$

$x=-\frac{2}{3}$ or $x=-\frac{2}{3}$ or $x=-\frac{2}{3}$

9.1 3.3 4.1 2.2

15. Solve

$9x^3-16x=0$

Formula $a^2-b^2=(a+b)(a-b)$

$x(9x^2-16)=0$

$x((3x)^2-(4)^2)=0$

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

Let $x=0$ or $3x+4=0$ or $3x-4=0$

$3x+4-4=0-4$ or $3x-4+4=0+4$

$3x=-4$ or $3x=4$

$\frac{3x}{3}=\frac{-4}{3}$ or $\frac{3x}{3}=\frac{4}{3}$

$x=-\frac{4}{3}$ or $x=\frac{4}{3}$

16. Solve

$25x^3 - 30x^2 + 8x = 0$

$x(25x^2 - 30x + 8) = 0$

$x(5x-2)(5x-4) = 0$

Set $x = 0$ OR $5x - 2 = 0$ OR $5x - 4 = 0$

$5x - 2 + 2 = 0 + 2$ OR $5x - 4 + 4 = 0 + 4$

$5x = 2$ OR $5x = 4$

$\frac{5x}{5} = \frac{2}{5}$ OR $\frac{5x}{5} = \frac{4}{5}$

$x = \frac{2}{5}$ OR $x = \frac{4}{5}$

$25 \cdot 1$, $5 \cdot 5$ | $8 \cdot 1$, $2 \cdot 4$ possibilities (6)

17. Simplify

$\frac{2y}{4y+2} \cdot \frac{10y+5}{7} =$

$\frac{2y}{2(2y+1)} \cdot \frac{5(2y+1)}{7} =$

$\frac{5y}{7} =$

Simplify

18.

$\frac{x^2-y^2}{x+y} \div \frac{x}{x^2-xy} =$

$\frac{x^2-y^2}{x+y} \cdot \frac{x^2-xy}{x} =$

$\frac{(x+y)(x-y)}{(x+y)} \cdot \frac{x(x-y)}{x} =$

$(x-y)(x-y) =$ OR $(x-y)^2 =$

19. Simplify

$$\frac{x^2-8x}{x-6}+\frac{12}{x-6}=$$

$$\frac{(x^2-8x)+(12)}{x-6}=$$

$$\frac{x^2-8x+12}{x-6}=$$

$$\frac{(x-2)(x-6)}{(x-6)}=$$

$$x-2=$$

12·1
6·2
3·4
possible

Solve

20.

$$13 \le 4t+5 \le 29$$

$$13-5 \le 4t+5-5 \le 29-5$$

$$8 \le 4t \le 24$$

$$\frac{8}{4} \le \frac{4t}{4} \le \frac{24}{4}$$

$$2 \le t \le 6$$

$$[2, 6]$$

21. Solve

$|x+3| = 6$

$|x| = a$ formula

$x = -a$ or $x = a$

8

so $x+3 = -6$ or $x+3 = 6$

$x+3-3 = -6-3$ or $x+3-3 = 6-3$

$x = -9$ or $x = 3$

22. Solve

$|x+18| < 9$

formula

$|x| < a$

$-a < x < a$

$-9 < x+18 < 9$

$-9-18 < x+18-18 < 9-18$

$-27 < x < -9$

$(-27, -9)$

23. Solve

$|x+3| > 4$

$|x| > a$

$x < -a$ or $x > a$

so $x+3 < -4$ or $x+3 > 4$

$x+3-3 < -4-3$ or $x+3-3 > 4-3$

$x < -7$ or $x > 1$

$(-\infty, -7) \cup (1, +\infty)$

24. Simplify

$\sqrt{16x^{10}} =$

$\sqrt{4^2 x^{10}} =$

$4^1 x^5 =$

$4x^5 =$

25. $f(x) = \sqrt{2x+7}$ Find $f(37)$

$f(37) = \sqrt{2(37)+7}$

$f(37) = \sqrt{74+7}$

$f(37) = \sqrt{81}$

$f(37) = 9$

26. graph $f(x) = \sqrt{x} - 4$

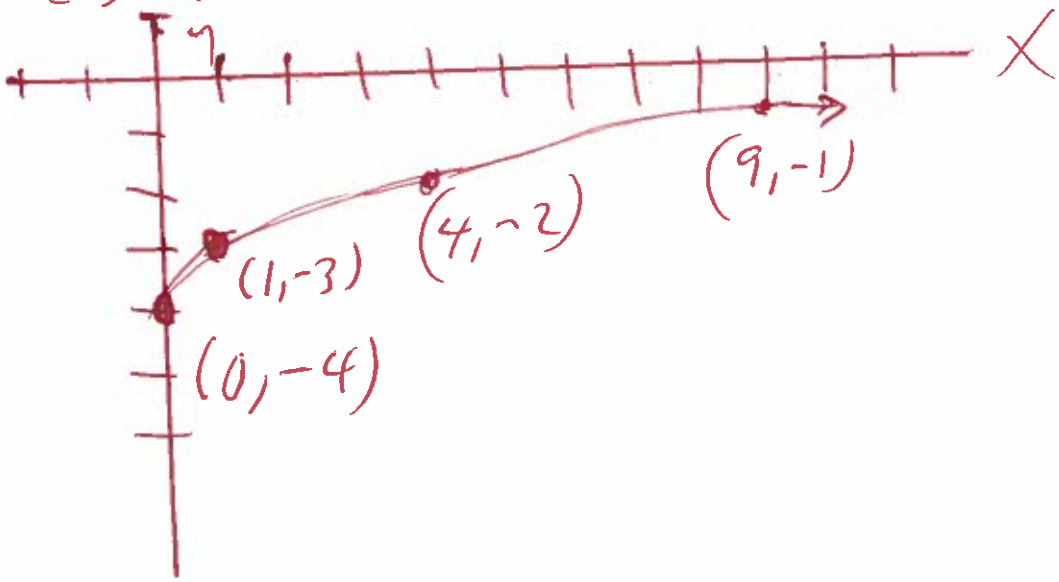
x	f(x)
0	-4
1	-3
4	-2
9	-1

$f(0) = \sqrt{0} - 4 = 0 - 4 = -4$

$f(1) = \sqrt{1} - 4 = 1 - 4 = -3$

$f(4) = \sqrt{4} - 4 = 2 - 4 = -2$

$f(9) = \sqrt{9} - 4 = 3 - 4 = -1$



27. $256^{1/4} =$

$(4^4)^{\frac{1}{4}} =$

$(4^{\frac{4}{1}})^{\frac{1}{4}} =$

$4^{\frac{4}{4}} =$

$4^1 =$

$4 =$

28. simplify

$\sqrt{20} =$

$\sqrt{4 \cdot 5} =$

$\sqrt{4}\sqrt{5} =$

$2\sqrt{5} =$

Primes 2, 3, 5, 7 ....

2 | 20

2 | 10

5 | 5

1

29. simplify

$\sqrt{320 k^7 Q^8} =$

$\sqrt{2^6 \cdot 5 \cdot k^6 k^1 Q^8} =$

$2^3 k^3 Q^4 \sqrt{5k} =$

$2 \cdot 2 \cdot 2\, k^3 Q^4 \sqrt{5k} =$

$8 k^3 Q^4 \sqrt{5k} =$

Primes 2, 3, 5, 7 ....

2 | 320

2 | 160

2 | 80

2 | 40

2 | 20

2 | 10

5 | 5

1

(30) $\sqrt[3]{512x^4y^5}$ Primes 2, 3, 5, 7, ...

$\sqrt[3]{2^9 x^3 x^1 y^3 y^2} =$

$2^3 x^1 y^1 \sqrt[3]{x^1 y^2} =$

$2 \cdot 2 \cdot 2 \; xy \sqrt[3]{xy^2} =$

$8xy\sqrt[3]{xy^2} =$

2 | 512
2 | 256
2 | 128
2 | 64
2 | 32
2 | 16
2 | 8
2 | 4
2 | 2
1

(31) Find distance $(-4, 2)$ and $(-12, -4)$
$x_1 \; y_1$ $x_2 \; y_2$

$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

$d = \sqrt{((-4) - (-12))^2 + ((2) - (-4))^2}$

$d = \sqrt{(-4+12)^2 + (2+4)^2}$

$d = \sqrt{(8)^2 + (6)^2}$

$d = \sqrt{64 + 36}$

$d = \sqrt{100}$

$d = 10$

(32) Find Mid point $(4, -8)$ and $(0, 4)$
$x_1 \; y_1$ $x_2 \; y_2$

Mid point $= \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

Mid point $= \left(\frac{(4)+(0)}{2}, \frac{(-8)+(4)}{2}\right)$

Mid point $= \left(\frac{4+0}{2}, \frac{-8+4}{2}\right)$

$= \left(\frac{4}{2}, \frac{-4}{2}\right)$

$= (2, -2)$

(33) Solve

$\sqrt{x+4} = 8$

$(\sqrt{x+4})^2 = (8)^2$

$x+4 = 64$

$x+4-4 = 64-4$

$x = 60$

(34) $\sqrt{20x+20} = x+6$

$(\sqrt{20x+20})^2 = (x+6)^2$

$20x+20 = (x+6)(x+6)$

$20x+20 = x^2+6x+6x+36$

$20x+20 = x^2+12x+36$

$0 = x^2+12x+36-20x-20$

$0 = x^2-8x+16$

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

Set $x-4=0$ or $x-4=0$

$x-4+4=0+4$ OR $x-4+4=0+4$

$x=4$ or $x=4$

Possible
16.1
8.2
4.4

Good

Ck $\sqrt{20x+20} = x+6$

$\sqrt{20(4)+20} = (4)+6$

$\sqrt{80+20} = 4+6$

$\sqrt{100} = 10$

$10 = 10$ ✓

{4}

35. $(6+6i)-(-9+i)=$

$6+6i+9-i=$

$6+6i+9-1i=$

$15+5i=$

36. $(5+3i)(5-3i)=$

$25-15i+15i-9i^2=$

$25-9i^2=$

$25-9(-1)=$

$25+9=$

$34=$ OR $34+0i$

Formula: $i^2=-1$

37. $\frac{8+7i}{9-2i}=$

$\left(\frac{8+7i}{9-2i}\right)\left(\frac{9+2i}{9+2i}\right)=$

$\frac{72+16i+63i+14i^2}{81+18i-18i-4i^2}=$

$\frac{72+79i+14i^2}{81-4i^2}=$

$\frac{72+79i+14(-1)}{81-4(-1)}=$

$\frac{72+79i-14}{81+4}=$

$\frac{58+79i}{85}=$

Formula: $i^2=-1$

$\frac{58}{85}+\frac{79i}{85}=$

38 $(x-5)^2 = 36$

$\sqrt{(x-5)^2} = \pm\sqrt{36}$

$x-5 = \pm 6$

aA $x-5 = -6$ OR $x-5 = 6$

$x-5+5 = -6+5$ OR $x-5+5 = 6+5$

$x = -1$ OR $x = 11$

39 $1x^2+24x+144 = 0$ use Quadratic formula

$a=1,\ b=24,\ c=144$

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

$$x = \frac{-(24) \pm \sqrt{(24)^2-4(1)(144)}}{2(1)}$$

$$x = \frac{-24 \pm \sqrt{576-576}}{2}$$

$$x = \frac{-24 \pm \sqrt{0}}{2}$$

$$x = \frac{-24 \pm 0}{2}$$

$x = -12 \pm 0$

$x = -12-0$ OR $x = -12+0$

$x = -12$ OR $x = -12$

(40) $1x^2 + 18x + 70 = 0$

$a=1,\ b=18,\ c=70$

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

$$x = \frac{-(18) \pm \sqrt{(18)^2-4(1)(70)}}{2(1)}$$

$$x = \frac{-18 \pm \sqrt{324-280}}{2}$$

$$x = \frac{-18 \pm \sqrt{44}}{2}$$

$$x = \frac{-18 \pm \sqrt{4 \cdot 11}}{2}$$

$$x = \frac{-18 \pm \sqrt{4}\sqrt{11}}{2}$$

$$x = \frac{-18 \pm 2\sqrt{11}}{2}$$

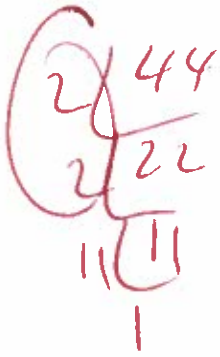
$$x = -9 \pm 1\sqrt{11}$$

$$x = -9 \pm \sqrt{11}$$

$x = -9 - \sqrt{11}$ or $x = -9 + \sqrt{11}$

Prime 2, 3, 5, 7...

(15)



Use Quadratic formula

41 $1x^2 - 8x + 20 = 0$

$a=1,\ b=-8,\ c=20$

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

$$x = \frac{-(-8) \pm \sqrt{(-8)^2-4(1)(20)}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{64-80}}{2}$$

$$x = \frac{8 \pm \sqrt{-16}}{2}$$

$$x = \frac{8 \pm 4i}{2}$$

$$x = 4 \pm 2i$$

$x = 4-2i$ or $x = 4+2i$

use Quadratic Formula

42 $2x^2 - 7x - 9 = 0$

$a=2,\ b=-7,\ c=-9$

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

$$x = \frac{-(-7) \pm \sqrt{(-7)^2-4(2)(-9)}}{2(2)}$$

$$x = \frac{7 \pm \sqrt{49+72}}{4}$$

$$x = \frac{7 \pm \sqrt{121}}{4}$$

$$x = \frac{7 \pm 11}{4}$$

$x = \frac{7-11}{4}$ or $x = \frac{7+11}{4}$

$x = \frac{-4}{4}$ or $x = \frac{18}{4}$

$x = -1$ or $x = \frac{2(9)}{2(2)}$

$x = \frac{9}{2}$

43 $7x^2 = -12x - 3$

Use Quadratic formula

$7x^2 + 12x + 3 = 0$

$a = 7,\ b = 12,\ c = 3$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(7)(3)}}{2(7)}$$

$$x = \frac{-12 \pm \sqrt{144 - 84}}{14}$$

$$x = \frac{-12 \pm \sqrt{60}}{14}$$

$$x = \frac{-12 \pm \sqrt{4 \cdot 15}}{14}$$

$$x = \frac{-12 \pm \sqrt{4}\sqrt{15}}{14}$$

$$x = \frac{-12 \pm 2\sqrt{15}}{14}$$

$$x = \frac{2(-6 \pm \sqrt{15})}{2(7)}$$

$$x = \frac{-6 \pm \sqrt{15}}{7}$$

Prime 2, 3, 5, 7

2 | 60
2 | 30
3 | 15
5 | 5
1

$x = \frac{-6 - \sqrt{15}}{7}$ OR $x = \frac{-6 + \sqrt{15}}{7}$

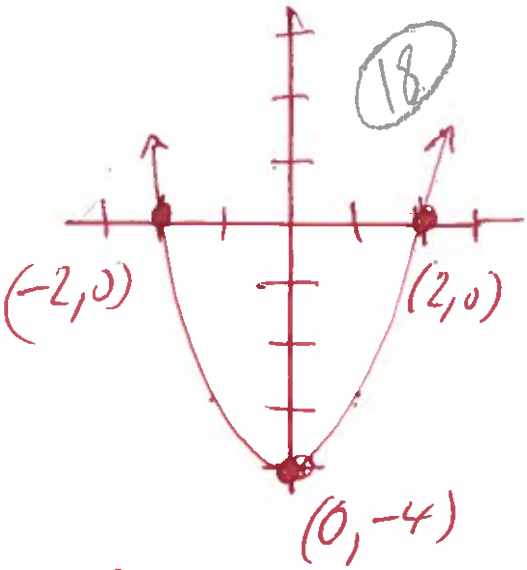
44 graph $f(x) = x^2 - 4$

x	f(x)
-2	0
0	-4
2	0

$f(-2) = (-2)^2 - 4 = (-2)(-2) - 4 = 4 - 4 = 0$

$f(0) = (0)^2 - 4 = (0)(0) - 4 = 0 - 4 = -4$

$f(2) = (2)^2 - 4 = (2)(2) - 4 = 4 - 4 = 0$



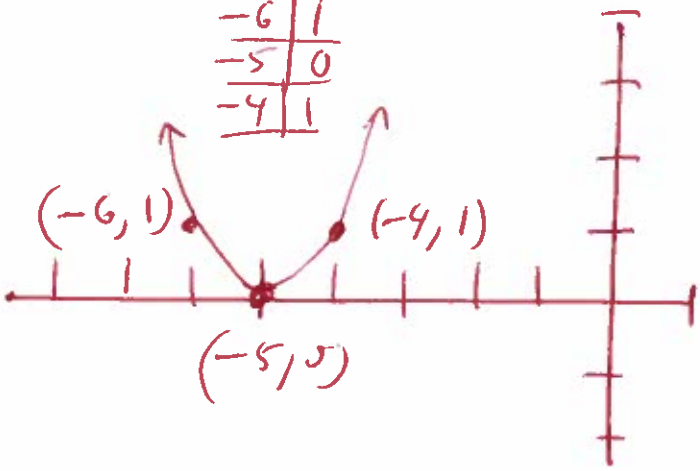
45 graph $f(x) = (x+5)^2$

x	f(x)
-6	1
-5	0
-4	1

$f(-6) = (-6+5)^2 = (-1)^2 = (-1)(-1) = 1$

$f(-5) = (-5+5)^2 = (0)^2 = (0)(0) = 0$

$f(-4) = (-4+5)^2 = (1)^2 = (1)(1) = 1$



46 graph $f(x) = -x^2 - 5$

$f(-1) = -(-1)^2 - 5 = -(-1)(-1) - 5 = -1 - 5 = -6$

$f(0) = -(0)^2 - 5 = -(0)(0) - 5 = 0 - 5 = -5$

$f(1) = -(1)^2 - 5 = -(1)(1) - 5 = -1 - 5 = -6$

x	f(x)
-1	-6
0	-5
1	-6