Placement Pretest
Math 0320
Intermediate
ALGEBRA

1.

Olivia

① $4x^5 + 16x^3 =$

$4x^3(x^2+4) =$

② $x^2 + x - 20 =$

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

20·1
10·2
4·5

③ $x^2 + 13xy + 36y^2 =$

$(x+4y)(x+9y) =$

36·1
18·2
12·3
6·6

④ $4x^2 + 12x - 40 =$

$4(x^2 + 3x - 10) =$

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

10·1
2·5

⑤ $6x^2 - x - 7 =$

$(6x-7)\cdot(x+1) =$

6·1
2·3

7·1

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

⑥ $81x^2 - 64 =$

$(9x)^2 - (8)^2 =$

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

⑦ $a^2 - 2ab - 24b^2 =$

$(a+4b)(a-6b) =$

24·1
12·2
6·4
3·8

⑧ $5y^3 - 5y^2 - 100y =$

$5y(y^2 - y - 20) =$

$5y(y+4)(y-5) =$

20·1
10·2
5·4

(9.) $x^2 + 2x - 48 = 0$

$(x-6)(x+8) = 0$

Set $x-6=0$ OR $x+8=0$

$x-6+6=0+6$ OR $x+8-8=0-8$

$x=6$ OR $x=-8$

2

(10.) $2x^2 - 3x - 5 = 0$

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

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

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

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

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

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

(11.) $\frac{8m^2p}{33p^4} \cdot \frac{11mp^3}{24m^7} =$

$\frac{8m^2p^1}{33p^4} \cdot \frac{11m^1p^3}{24m^7} =$

$\frac{8(11)m^3p^4}{33(24)p^4m^7} =$

$\frac{8(1)}{3(1)8(3)m^{7-3}} =$

$\frac{1}{9m^4} =$

(12) $\frac{x^2-3x}{x^2-9} \div \frac{x+3}{x^2+6x+9} =$

$\frac{x^2-3x}{x^2-9} \cdot \frac{x^2+6x+9}{x+3} =$

$\frac{x(x-3)}{(x+3)(x-3)} \cdot \frac{(x+3)(x+3)}{(x+3)} =$

$x =$

B.

(13) $\frac{m^2-9m}{m-6} + \frac{18}{m-6} =$

$\frac{(m^2-9m)+(18)}{m-6} =$

$\frac{m^2-9m+18}{m-6} =$

18·1
9·2
6·3

$\frac{(m-3)(m-6)}{(m-6)} =$

$m-3 =$

(14) $f(x) = x^2+3x-4$

$f(3) = (3)^2+3(3)-4$

$f(3) = (3)(3)+3(3)-4$

$f(3) = 9+9-4$

$f(3) = 18-4$

$f(3) = 14$

(15) $f(x) = \frac{x+5}{14x-10}$

$f(-10) = \frac{(-10)+5}{14(-10)-10}$

$f(-10) = \frac{-10+5}{-140-10}$

$f(-10) = \frac{-5}{-150}$

$f(-10) = \frac{5}{150}$

$f(-10) = \frac{5(1)}{5(30)}$

$f(-10) = \frac{1}{30}$

(16) $|x+1| = 7$

$|x| = a$
$x = -a$ OR $x = a$

Set $x+1 = -7$ OR $x+1 = 7$

$x+1-1 = -7-1$ OR $x+1-1 = 7-1$

$x = -8$ OR $x = 6$

(17) $|x+18| < 7$

$|x| < a$
$-a < x < a$

$-7 < x+18 < 7$

$-7-18 < x+18-18 < 7-18$

$-25 < x < -11$

$(-25, -11)$

(18) $|8k-6| \geq 3$

$|x| > a$
$x < -a$ OR $x > a$

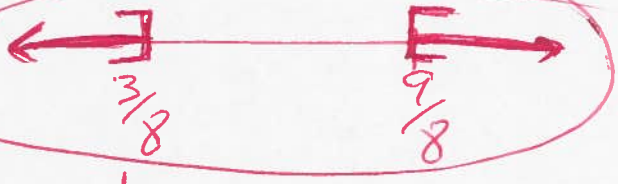
$8k-6 \leq -3$ OR $8k-6 \geq 3$

$8k-6+6 \leq -3+6$ OR $8k-6+6 \geq 3+6$

$8k \leq 3$ OR $8k \geq 9$

$\frac{8k}{8} \leq \frac{3}{8}$ OR $\frac{8k}{8} \geq \frac{9}{8}$

$k \leq \frac{3}{8}$ OR $k \geq \frac{9}{8}$



$(-\infty, \frac{3}{8}] \cup [\frac{9}{8}, +\infty)$

(19) $16^{1/4} =$

$(2^4)^{1/4} =$

$2^{\frac{4}{1}(\frac{1}{4})} =$

$2^{\frac{4}{4}} =$

$2^1 =$

$2 =$

(20) $\sqrt{300k^7Q^8} =$

$\sqrt{100 * 3 k^6 k^1 Q^8} =$

$10k^3Q^4\sqrt{3k} =$

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

2 | 300
2 | 150
3 | 75
5 | 25
5 | 5
1

(21.) $\sqrt[3]{343x^4y^5} =$

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

$7 \mid 343$

$7 \mid 49$

$7 \mid 7$

1

$\sqrt[3]{7^3 x^3 x^1 y^3 y^2}$

$7^1 x^1 y^1 \sqrt[3]{x^1 y^2} =$

$7xy\sqrt[3]{xy^2} =$

(22.) $\sqrt[3]{32} =$

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

$2 \mid 32$

$2 \mid 16$

$2 \mid 8$

$2 \mid 4$

$2 \mid 2$

1

$\sqrt[3]{2^5} =$

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

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

$2\sqrt[3]{4} =$

(23.) $\sqrt{x+5} = 6$

$(\sqrt{x+5})^2 = (6)^2$

$x+5 = 36$

$x+5-5 = 36-5$

$x = 31$

(24) $(6-3i)(5+9i) =$

$30 + 54i - 15i - 27i^2 =$

$30 + 39i - 27i^2 =$

$30 + 39i - 27(-1) =$

$i^2 = -1$

$30 + 39i + 27 =$

$57 + 39i =$

(25.) $\frac{9+5i}{9+4i} =$

$\left(\frac{9+5i}{9+4i}\right)\left(\frac{9-4i}{9-4i}\right) =$

$\frac{81-36i+45i-20i^2}{81-36i+36i-16i^2} =$

$\frac{81+9i-20i^2}{81-16i^2} =$

$\frac{81+9i-20(-1)}{81-16(-1)} =$

$\frac{81+9i+20}{81+16} =$

$\frac{101+9i}{97} =$

$\frac{101}{97} + \frac{9i}{97} =$

(26) $(x-7)^2 = 4$

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

$x-7 = \pm 2$

$x-7 = -2$ OR $x-7 = 2$

$x-7+7 = -2+7$ OR $x-7+7 = 2+7$

$x = 5$ OR $x = 9$

(27.) $x^2+4x-45=0$ (Complete the Square)

$x^2+4x = 45$

$x^2+4x+\left(\frac{1}{2}(4)\right)^2 = 45+\left(\frac{1}{2}(4)\right)^2$

$x^2+4x+(2)^2 = 45+(2)^2$

$x^2+4x+4 = 45+4$

$x^2+4x+4 = 49$

$(x+2)(x+2) = 49$

$(x+2)^2 = 49$

$\sqrt{(x+2)^2} = \pm\sqrt{49}$

$x+2 = \pm 7$

$x+2 = -7$ OR $x+2 = 7$

$x+2-2 = -7-2$ OR $x+2-2 = 7-2$

$x = -9$ OR $x = 5$

By Factoring

$x^2+4x-45=0$

$(x-5)(x+9)=0$

Set $x-5=0$ OR $x+9=0$

$x-5+5=0+5$ OR $x+9-9=0-9$

$x=5$ OR $x=-9$

(28.) $1x^2 + 12x + 14 = 0$

$a = 1, \; b = 12, \; c = 14$

Use the Quadratic Formula

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

$$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(1)(14)}}{2(1)}$$

$$x = \frac{-12 \pm \sqrt{144 - 56}}{2}$$

$$x = \frac{-12 \pm \sqrt{88}}{2}$$

$$x = \frac{-12 \pm \sqrt{4 * 22}}{2}$$

$$x = \frac{-12 \pm \sqrt{4}\sqrt{22}}{2}$$

$$x = \frac{-12 \pm 2\sqrt{22}}{2}$$

$$x = \frac{2(-6 \pm 1\sqrt{22})}{2}$$

$$x = -6 \pm 1\sqrt{22}$$

$x = -6 - \sqrt{22}$ OR $x = -6 + \sqrt{22}$

9.

Primes 2, 3, 5, 7, 11

2 | 88
2 | 44
2 | 22
11 | 11
1

(29) $3x^2 + 10x + 4 = 0$

$a = 3,\ b = 10,\ c = 4$

Use the Quadratic formula

10

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

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(3)(4)}}{2(3)}$$

$$x = \frac{-10 \pm \sqrt{100 - 48}}{6}$$

$$x = \frac{-10 \pm \sqrt{52}}{6}$$

$$x = \frac{-10 \pm \sqrt{4 * 13}}{6}$$

$$x = \frac{-10 \pm \sqrt{4}\sqrt{13}}{6}$$

$$x = \frac{-10 \pm 2\sqrt{13}}{6}$$

$$x = \frac{2(-5 \pm 1\sqrt{13})}{2(3)}$$

$$x = \frac{-5 \pm \sqrt{13}}{3}$$

Primes 2, 3, 5, 7, 11, 13, ...

2 | 52

2 | 26

13 | 13

1

$$x = \frac{-5 - \sqrt{13}}{3} \quad \text{OR} \quad x = \frac{-5 + \sqrt{13}}{3}$$

(30) $1x^2 + 10x + 34 = 0$

Use the Quadratic Formula

$a = 1,\ b = 10,\ c = 34$

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

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(34)}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{100 - 136}}{2}$$

$\sqrt{-1} = i$

$$x = \frac{-10 \pm \sqrt{-36}}{2}$$

$$x = \frac{-10 \pm 6i}{2}$$

$$x = \frac{-10}{2} \pm \frac{6i}{2}$$

$$x = -5 \pm 3i$$

$x = -5 - 3i$ OR $x = -5 + 3i$