

SHOW ALL WORK ON THIS TEST OR ON SEPARATE PAPER. Circle answers.
 TURN IN ALL WORKSHEETS. CALCULATORS ARE REQUIRED ON THIS TEST.
 EXPLAIN ALL CALCULATOR STRATEGIES AND DRAW GRAPHS WHEN USED!

In 1 - 3, factor completely and simplify if possible:

1. $a^3 - 2a^2b - 25ab^2 + 50b^3$ 2. $(2X-Y)^2 - 3(2X-Y) - 10$

3. $X^{\frac{3}{2}} - 9X^{-\frac{1}{2}}$

In 4 - 7, use the calculator to evaluate:

Give scientific notation, or round to nearest hundredth.

4 a) $\frac{72,000 \cdot 0.0063}{0.035 \cdot 81}$ b) $\frac{6.3 \times 10^{-8}}{8.1 \times 10^{14}}$

Give the calculator values (nearest hundredth)!!

5a) $\sqrt[5]{7,000,000}$ b) $\frac{17\sqrt{30} + 46\sqrt{17}}{13\sqrt{2} - 7\sqrt{7}}$ c) $(17\sqrt{30} + 46\sqrt{17})^3$

6a) $125^{2/3}$ b) $49^{-3/2}$ (Give fractional form!)

Give answers in the form of "a + bi":

7a) $(1 + i)^3$ b) i^{15} c) $\frac{53 + 53i}{5 + 9i}$

CALCULATOR !!

8. Simplify the fraction:

$$\frac{X + 2}{X^2 - 6X + 8} - \frac{X}{X^2 - 4}$$

9. Simplify: $\frac{X^{-2} - Y^{-2}}{X^{-1} - Y^{-1}}$

In 10 - 12, simplify the radicals (rationalize denominators):

10a) $\sqrt{72X^9Y^{10}}$

11a) $\sqrt{35} \cdot \sqrt{77}$

12. $\frac{20}{3\sqrt{6} - 2}$

b) $\sqrt[3]{16} + \sqrt[3]{54}$

b) $\frac{12}{\sqrt[3]{4}}$

In 13 - 18, solve for X. Calculator methods MAY be appropriate:

13. $P = \frac{XY}{a + bX}$

14. $\sqrt{3X + 1} - \sqrt{X} = 3$

$$1. a^3 - 2a^2b - 25ab^2 + 50b^3$$

$$a^2(a-2b) - 25b^2(a-2b)$$

$$(a-2b)(a^2-25b^2)$$

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

$$2. (2x-y)^2 - 3(2x-y) - 10$$

$$[(2x-y) - 5][(2x-y) + 2]$$

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

$$3. x^{3/2} = 9x^{-1/2}$$

$$x^{-1/2} [x^{3/2 - (-1/2)}] = 9$$

$$\frac{1}{x^{1/2}} [x^2 - 9]$$

$$\frac{(x-3)(x+3)}{x^{1/2}}$$

$$4a) (72000 \times 0.063) \div (0.35 \times 81) = 160$$

$$4b) 6.3 \text{ E } (-) 8 \div 8.1 \text{ E } 14 = 7.78 \times 10^{-23}$$

$$5a) \text{ custom } > 5, \sqrt{\quad}, 7000000 = 23.39$$

$$b) (17 \text{ 2nd } \sqrt{30} + 46 \text{ 2nd } \sqrt{17})$$

$$\div (13 \text{ 2nd } \sqrt{2} - 7 \text{ 2nd } \sqrt{7}) = -2087.17$$

$$c) (17 \text{ 2nd } \sqrt{30} + 46 \text{ 2nd } \sqrt{17}) \wedge 3 = 22611336.27$$

$$\text{ or } 2.26 \times 10^7$$

$$6a) 125^{2/3}$$

$$(\sqrt[3]{125})^2$$

$$= 5^2$$

$$= 25$$

$$6b) 49^{-3/2}$$

$$= (\sqrt{49})^{-3}$$

$$= 7^{-3}$$

$$= \frac{1}{343}$$

$$7a) (1, 1) \wedge$$

$$= (-2, 2)$$

$$= -2 + 2i$$

$$7c) (0, 1) \wedge 15$$

$$= (0, -1) = -$$

$$8. \frac{x+2}{(x-4)(x-2)} - \frac{x}{(x-2)(x+2)}$$

$$\frac{(x+2)(x+2)}{(x-4)(x-2)(x+2)} - \frac{x(x-4)}{(x-2)(x+2)(x-4)}$$

$$\frac{x^2 + 4x + 4 - x^2 + 4x}{(x-4)(x-2)(x+2)}$$

$$\frac{8x + 4}{(x-4)(x-2)(x+2)} \text{ or } \frac{4(2x+1)}{(x-4)(x-2)(x+2)}$$

$$9. \frac{x^2 - y - 2}{x^{-1} - y - 1}$$

$$= \frac{\frac{1}{x^2} - \frac{1}{y^2}}{\frac{1}{x} - \frac{1}{y}}$$

$$\frac{\frac{y^2 - x^2}{x^2 y^2}}{\frac{y - x}{xy}}$$

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

$$10a) \sqrt{72x^9y^{10}}$$

$$\sqrt{36x^8y^{10}} \sqrt{2x}$$

$$6x^4y^5\sqrt{2x}$$

$$10b) \sqrt[3]{16} + \sqrt[3]{54}$$

$$\sqrt[3]{8}\sqrt[3]{2} + \sqrt[3]{27}\sqrt[3]{2}$$

$$2\sqrt[3]{2} + 3\sqrt[3]{2}$$

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

$$11a) \sqrt{7.5} \cdot \sqrt{7.11}$$

$$\sqrt{7^2 \cdot 55}$$

$$7\sqrt{55}$$

$$12. \frac{20}{(3\sqrt{6}-2)(3\sqrt{6}+2)}$$

$$\frac{20}{9 \cdot 6 - 4}$$

$$\frac{20(3\sqrt{6}+2)}{50}$$

$$\frac{2(3\sqrt{6}+2)}{5}$$

$$11b) \frac{12\sqrt{2}}{\sqrt[3]{4}\sqrt[3]{2}} = \frac{12\sqrt[3]{2}}{2}$$

$$= 6\sqrt[3]{2}$$

$$15. (x-5)^2 = 40$$

$$x-5 = \pm\sqrt{40}$$

$$x = 5 \pm 2\sqrt{10}$$

$$16. x^2 - 4x - 2 = 0$$

Quad Formula or

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

$$= \frac{4 \pm \sqrt{16 - 4(1)(-2)}}{2}$$

$$= \frac{4 \pm \sqrt{24}}{2}$$

$$= \frac{4 \pm 2\sqrt{6}}{2}$$

$$= 2 \pm \sqrt{6}$$

$$16. \text{ Complete Sq:}$$

$$x^2 - 4x + \underline{\quad} = 2 + \underline{\quad}$$

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

$$(x-2)^2 = 6$$

$$x-2 = \pm\sqrt{6}$$

$$x = 2 \pm \sqrt{6}$$

$$17. x^2 + 6x + 10 = 0$$

Comp. Square =

$$x^2 + 6x + 9 = -10 + 9$$

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

$$x+3 = \pm\sqrt{-1} = \pm i$$

$$x = -3 \pm i$$

Also use 2nd Deriv!

$$13. p = \frac{xy}{a+bx}$$

$$pa + pbx = xy$$

$$pa = xy - pbx$$

$$pa = x(y - pb)$$

$$y - pb = \frac{pa}{y - pb}$$

$$x = \frac{pa}{y - pb}$$

ALG METHOD

$$14. (\sqrt{3x+1})^2 = (\sqrt{x+3})^2$$

$$3x+1 = x+6\sqrt{x}+9$$

$$-x-9 -x \quad -9$$

$$2x-8 = 6\sqrt{x} \quad (\div 2)$$

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

$$x^2 - 8x + 16 = 9x$$

$$-9x$$

$$x^2 - 17x + 16 = 0$$

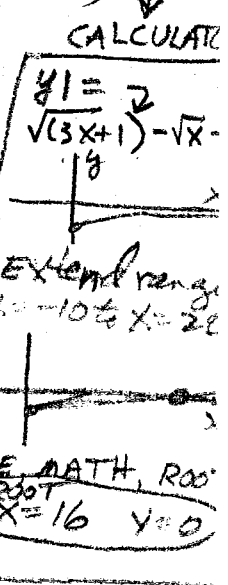
$$(x-16)(x-1) = 0$$

$$x = 16 \quad x = 1$$

Ch = x = 16 Reject!

$$\sqrt{48+1} = \sqrt{16} + 3$$

$$7 = 4 + 3$$



$$18. (x^2+5x)^2 - 2(x^2+5x) - 24 = 0$$

$$(x^2+5x-6)(x^2+5x+4) = 0$$

$$(x+6)(x-1)(x+4)(x+1) = 0$$

$$x = -6 \quad x = 1 \quad x = -4 \quad x = -1$$

